NEW ZEALAND

Handbook of Instruction

The Royal Life Saving Society

Founded 1891. Incorporated by Royal Charter

Patron:

HER MAJESTY THE QUEEN

Grand President:

ADMIRAL OF THE FLEET
THE EARL MOUNTBATTEN OF BURMA
K.G., P.C., G.C.B., O.M., G.C.S.I., G.C.I.E., G.C.V.O., D.S.O.

New Zealand

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HIS EXCELLENCY THE GOVERNOR GENERAL

President: G. D. GRIFFITHS, J.P.

HANDBOOK of INSTRUCTION

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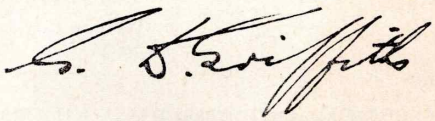
Foreword

SINCE 1891, when the Society was founded in England, many people have been saved from drowning by those who have learnt the Society's methods. The Society was established in New Zealand in 1910, from which time it has had every assistance from Headquarters in London, including the use of the Society's Handbook of Instruction. Although the basic releases and rescues taught have changed little until now, they have served the Society well. The method of Artificial Respiration, however, has been, and is being continually reviewed.

In 1960 Her Majesty The Queen, the Royal Patron, granted a Supplemental Charter to the Society, giving a greater measure of independence to the National Branches of United Kingdom, Canada, Australia and New Zealand. Now these Branches have representatives on the Commonwealth Council and are responsible for life saving in their own countries. Each has produced its own Handbook to allow for conditions which vary from place to place, but all have a basic similarity and are strongly linked by their interest in this humanitarian work.

In this first Handbook prepared by the Council of The Royal Life Saving Society, New Zealand, the practical life saving methods printed are the results of intensive study of many methods used throughout the world.

I recommend all those who use this book to study carefully its contents, and to practise conscientiously its methods so that they are competent in the examinations for the awards of the Society and are prepared, should the necessity arise, to save a fellow man from drowning.



President

THE ROYAL LIFE SAVING SOCIETY, NEW ZEALAND

Aims and Objects

(a) TO PROMOTE technical education in life saving and resuscitation of the apparently drowned.

(b) TO STIMULATE public opinion in favour of general adoption of swimming and life saving as a branch of instruction in schools, colleges, clubs, etc.

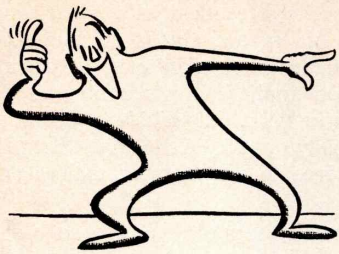
(c) TO ENCOURAGE floating, diving, plunging and such other swimming arts as would be of assistance to a person endeavouring to save life.

(d) TO ARRANGE and promote public lectures, demonstrations and competitions and to form classes of instructions, so as to bring about a widespread and thorough knowledge of the principles which underlie the art of natation.

Motto

QUEMCUNQUE MISERUM VIDERIS HOMINEM SCIAS

"Whomsoever you see in distress recognise in him a fellow man."



INTRODUCTION

There has never been a time when men have not lost their lives as a result of misadventure on or in the water. Towards the end of the 19th century, increasing concern was being shown for the large numbers drowned each year, and the Life Saving Society was founded in an attempt to combat the appalling loss. Among the Society's founders was William Henry himself a keen swimmer, who was appointed the first Chief Secretary and was, by his enthusiasm, responsible for the establishment of branches throughout the Empire. Permission was given to use the title "Royal" in 1904, three years after King Edward VII had consented to be Royal Patron.

New Zealand was visited by William Henry in 1910, when he met local enthusiasts and set up several Head Centres. As the Society's methods of life saving became better known, interest gradually increased, and patrol work on the beaches was instituted. This section of the humanitarian work developed rapidly and was the spur for the formation of the New Zealand Surf Life Saving Association (the Surf Section of the Society) in 1932. Since that date, on parallel courses, the two organisations have been responsible for beach patrols, and instruction and examinations, respectively. Now there are some eighty Surf Clubs, and an annual issue of over 23,000 Royal Life Saving Society awards.

The methods of life saving and artificial respiration explained in this book are the results of much research and thought by many people the world over. They form a basis for action which, with practice, will equip a competent swimmer with confidence and ability to go to the rescue of someone in distress in the water, and with the knowledge to apply correctly, artificial respiration to the asphyxiated.

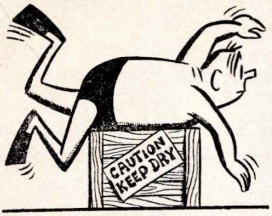
It is hoped that those who are successful in gaining the Society's awards will not only maintain their interest in its work, and in their turn instruct and present classes of candidates, but also keep up their practice so that they are ready to put their expert knowledge to use should the need arise.

The Society leans heavily on school teachers who encourage their pupils to become proficient life savers, and is grateful for their continued help. Artificial respiration is now easy to teach, simple to learn, and effective when applied. It is recommended, therefore, that teachers make sure that all scholars become familiar with this part of the Society's work. A booklet "Resuscitation Instruction" is available free to aid them in their class instruction.

Those who wish to give financial support, can do so individually by a donation or by becoming a member of a branch of the Society, a 50 cents subscription annually, a Life Member of a Branch by one payment of 21 dollars and a Branch Life Governor by subscribing 42 dollars.

Such support promotes the aims and objects of the Society and enables branches to widen the scope of their work.

To those who read this book, assimilate the information it contains, and become proficient in the methods explained, it is recommended that they are always prepared to act to save a life if ever required to do so. This state of preparedness is best maintained by occasionally visualising various situations in which help can be given, and working out, in detail, in the mind's eye, how best to render aid. In this way, panic is avoided and the correct action to help the victim is taken without delay.



WATER SAFETY

Living in an island country, well endowed with lakes and rivers, New Zealanders are never far from water, and the ever-present risk of death by drowning. A more thorough knowledge of Water Safety, plus the use of commonsense, would considerably reduce the number of lives lost in the water. Investigations show that a little more care and greater attention ot Water Safety principles, would reduce the drowning rate by about 75 per cent.

A good start is to see that all children learn to swim competently, for too many fatalities occur amongst children under 11 years of age. If all children were taught to swim, not only would it reduce the number of drownings in the particular age group, but it would also, in time, lead to fewer lives being lost among adults. Learning to swim and Water Safety go hand in hand, for even a strong swimmer can get into serious difficulties by misjudging conditions or being foolhardy.

CAUSES OF DROWNING ACCIDENTS

Over the years, a pattern has emerged showing the circumstances that lead, each year, to the death of more than a hundred people of all ages. The more common causes are listed below, and should be kept in mind so that the reader can avoid risks that endanger life.

- Inadequate supervision of young children when playing in or near water. As little as 3 inches of water in the bath at home can also be lethal.
- Bathing alone in unsupervised areas and in unfamiliar or isolated waters.
- Disregard of protective walls, fences and notices.
- Over-confidence by the one-time fit swimmer.
- The misuse of air mattresses and inflatable toys, especially on lakes and at the beach.
- Unskilled handling of boats and the failure to wear life jackets.

Lack of care when fishing from rocks, and in rivers with unstable shingle beds.

Taking undue risks when crossing rivers.

Each year, in this country, the Water Safety Council issues a grim survey of drowning accidents, from which the following table, representative of an average year, has been prepared:

Found Drowned—Children under the age of 5:

In rivers and streams	7
Ponds, creeks, ditches	5
Water troughs and sheep dips	5
Ocean beaches	3
Lakes	1
	— Total 21

Children between the ages of 5 and 10:

Swimming accidents	1
Boating accidents	1
Playing near rivers and creeks	5
Fall into well—edge gave way	1
Slipping from log while crossing river	1
Fall into pool	1
	— Total 10

Swimming accidents over the age of 10:

In rivers and streams	3
Ocean beaches	4
Swimming pools	3
Harbours	1
	— Total 11

Boating accidents over the age of 10:

In rivers	5
Open Sea	15
Lakes	12
Harbours	3
Dams	1
	— Total 36

Fishing off rocks:

Ages between 20 and 50	3
	— Total 3

Miscellaneous accidents over the age of 10:

Trying to save others	4
Crossing river on foot	4
Crossing river on horse	2
Crossing river by means of overhanging tree	1
Fishing in river	3
Net fishing	2
Surf fishing	1
Found drowned in harbour	5
Found drowned in bath at home	1
Found drowned in creek	1
Diving with aqualung	1
Diving for crayfish	1
Diving into shallow water	1
Falling into river	2
Falling from wharf	1
Falling through ice on dam	1
Slipping into drainage pond	1
	— Total 32

Grand Total 113

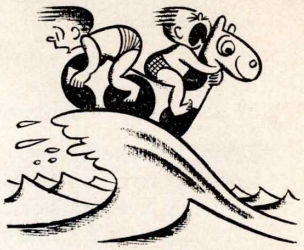
Many people through the country, including the thousands who have qualified as life savers by passing R.L.S.S., N.Z. examinations, are actively practising water safety, and, by their example, encouraging others to do likewise. Because of their efforts, the ratio of drowning in 100,000 of population has fallen to 4.44 and should continue to fall.

The figures just listed show that approximately one-third of the total deaths are of young children under 11 years old, and many of these lives were lost because of inadequate supervision.

Toddlers are fascinated by water, but they cannot protect themselves from its dangers. Even the bath at home can quickly

claim a life. If children cannot be constantly watched when near water, they should be prevented from getting to it by secure fences. Young folk are naturally attracted to floats, especially plastic and rubber toys, air mattresses and tyre tubes, and whilst these give a sense of security, they can carry their passengers out of their depth, leading to panic and tragedy.

Young Children



It is wise for an adult to enter the water to test the conditions before children go for a swim, whether it is at the beach, river or waterhole.

The bather who prefers to swim on his own is, in fact taking quite a risk. It is better not to swim alone, but if he must, then he is advised to inspect thoroughly the swimming place. The use of a long stick gives a good idea of depth, but even if this proves to be adequate, he should not dive in and risk a broken neck. If in difficulties do not panic as this would waste the energy required to reach safety.

The Lone Bather

Swimming on ocean beaches when unfamiliar with the conditions, has been the cause of many lives being claimed by the sea. One should avoid the dumping surf with quickly breaking waves and powerful backwash where it is easy to lose a footing and be dashed on to the bottom. Where a beach is being patrolled by surf club members ALWAYS BATHE BETWEEN THE PATROL FLAGS. No lives have been lost on a patrolled beach for many years. Those who enjoy the surf can do so without risk by observing these simple points:

At the Beach

- Leave the water beyond the breakers to trained, fit swimmers. Waist deep water can provide lots of fun.
- It is safer to dive under a wave than through it. Keep the eyes open when "shooting" a wave to avoid colliding with other bathers. Watch out for surf boards and skis.

Remember that air mattresses and inflatable toys can carry their riders out to sea in an off-shore wind.

Keep a prominent land mark in view to check the strength of drift.

If caught in a rip or current, don't panic, swim across it, edging to safety. Don't become exhausted, float for a little and calmly decide what to do. One hand held high will bring assistance on a patrolled beach.

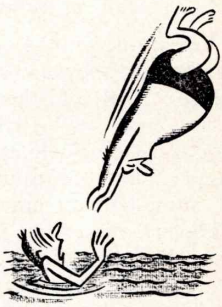
At unpatrolled beaches, obey instructions on warning signs. Keep clear of rocks.

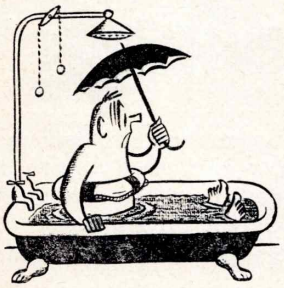
Come out of the water before feeling really cold.

Don't venture out too far, even if a competent swimmer.

The Bathing Pool

The side walks around a pool are often slippery. It is, therefore, very dangerous to run, jump, chase or push people at these places. Never dive or jump into a pool, whether from the side or diving board, without first looking to see that the place of entry is clear of other bathers, and when in the water, do not loiter under the diving board or platform area.





"Ducking" other swimmers, especially when they are taken unaware, is a foolish pastime. It is a frightening experience for the weak swimmer, while for the person who cannot swim it can be terrifying, so much so, that the victim may be in fear of the water for the rest of his life.

Swimming Holes

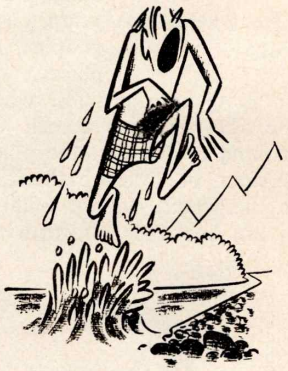
Swimming holes can have changed since the previous visit, so they should be inspected carefully before swimming in them. Be sure that—

- There is adequate depth. Even in clear water this can be deceiving. Check with a stick and never dive or jump in until certain the pool is deep enough and free from snags.

- When picnicking, a responsible person is constantly watching the children who can be paired off to keep an eye on each other.
- Children are kept away from stormwater channels, drains, irrigation ditches, and sheep dips, as these have claimed many young lives.
- If entangled in weeds, don't struggle, but quickly and gently untangle them.
- Disused quarries, water holes for cattle, and old excavations are avoided, as these are usually of varying depth and do not allow for easy exit.

Many drownings occur in rivers and streams, often because it is thought they are safe swimming places. All of them should be considered as possible hazards and safety principles always practised. That "refreshing plunge" in a snow-fed stream can lead to disaster when the swimmer temporarily disregards his safety as the shock of the cold water reduces his strength. Cloudy or dirty water in a normally placid stream gives warning of flood condition, so beware, no swimming. Sometimes a hole in a river with steep banks looks attractive, and if tempted to swim there, the swimmer should be sure that downstream there is a place to get out easily without physical effort. If caught in a strong current, he should edge diagonally across the current to the bank even though he might be carried a considerable distance downstream in the process.

Rivers

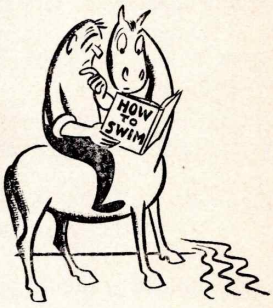


Tramper

As more accidents occur when trampers and mountaineers are crossing rivers and streams than when they are climbing, members of clubs are taught how to cross correctly. They learn to—

- Consider all rivers as capable of being treacherous, and to take care in choosing a crossing place.
- Cross where there is a smooth firm gravel bottom, and avoid, if possible, boulders, smooth slabs, mud, logs and snags.
- Wear shorts, as slacks have a greater water resistance, and always wear boots.
- Seek calm, slow-moving water, and never enter water when rolling boulders can be heard or when trees or branches are being swept along.
- Cross before the water begins to rise, when rain is falling heavily in the area, but if this can't be done, wait, even camp, until it goes down again.

Horseman



Before crossing a river, a horseman knowing his ability, should consider the risks involved. If in doubt, DON'T CROSS. If a decision to cross has been made, it is wise to choose a place where there are no obstructions downstream, then unbuckle the ends of the reins so that neither rider nor mount will become entangled, and enter the water unhurriedly. If the horse has to swim, the rider should grasp the mane about 18 inches from the horse's ears and slide off its back on the upstream side. From this position floating near the surface of the water, he should guide the horse diagonally downstream with a light touch on the reins.

Boatman

A sailor of experience has learnt many things that he does quite automatically to keep himself safe while on the water, but boat owners not familiar with water and its ways, have to prepare themselves to enjoy their craft. Some simple rules are given here so that the craft, be it row boat, canoe, yacht, or power boat, will not become an instrument of death.

The boat should be seaworthy before it is used. Check that—The rowlocks are secured to some part of the boat; There are two oars; The draining cock or bung is securely in place; The boat contains a suitable baler.

When entering a boat, always step gently into the centre and steady oneself by placing one hand on either side.

If there are passengers, always distribute the weight evenly.

When moving about, do so slowly, crouch low and move along the centre of the boat, only one person at a time changing position.

To rescue a person, if using a boat, always lift him inboard over the stern. Stop the motor before coming alongside the victim.

Wear a life jacket at all times, and see that all passengers do the same.

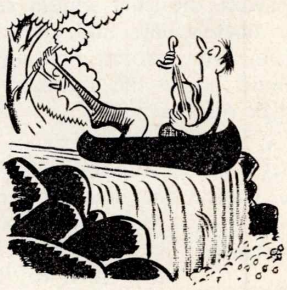
Canoeing as a sport is gaining in popularity to such an extent that there are now a number of clubs where correct instruction is given in use of these intriguing craft.

Canoeist

While general principles of water safety apply to the canoeist, a few additional points should be noted.

Canoeists should travel in groups and should be able to swim at least 50 yards fully clothed.

Equipment should be neatly stowed and evenly distributed by weight throughout the canoe.



Rapids must be inspected carefully, and the canoe guided through by rope or carried around them if there is any doubt about a safe passage.

If disaster is imminent in rapids, try to leave on the

upstream side of the canoe to avoid getting between it and rocks. Swim either breast stroke or dog paddle with the current, but proceed feet first where there are projecting rocks or snags.

Fisherman

All fishermen, whether fishing from rocks, boats, wharves, the beach or underwater, should not go alone. Changing weather conditions can be a danger to fishermen, so the weather report of the day should always be checked before setting out. After selecting a site, keep a careful eye on the weather. The excitement of a good catch in a small boat will not endanger the safety of fishermen if they have drilled themselves in safety principles (page 14). It is wise to advise companions when any change of position in the boat is contemplated. Thigh waders are of no use in a boat, and have been known, after filling with water, to take their wearer to the bottom. Fishing from rocks is quite safe if the fishermen uses footwear that does not become slippery when wet, and has selected an easy route to higher ground out of reach of the unexpected big wave. If caught unawares, it is best to stand, legs apart, one foot in front of the other as the water swirls around.

Skin Diver

With the rapid growth of skin diving, there will be a natural tendency for the number of diving accidents to increase unless each diver becomes safety conscious for the sake of himself and his companions. All participants in this pastime should join recognised clubs where they can be trained to enjoy skin diving and spear fishing without taking foolish risks. There are many water safety points to be observed, the basic ones being:

- Never dive alone, nor too soon after a heavy meal.
- Always keep under observation the person who is diving with you.
- Select a safe place to enter and leave the water. Do not try to regain land on a rocky

shore through a heavy surf. Swim out against the currents so that you can return with them.

Clear ears during descent, either by swallowing or by holding mask against nose and blowing. Pain from pressure ineqaulity is followed rapidly by ruptured ear drums, dizziness and often, by a blackout. Never use ear plugs. If unable to clear ears—don't dive.

When diving in a surge or murky water, hold on to rocks on the bottom to prevent being washed around. Wear gloves to protect the hands.

Start for the surface before running completely out of air. This provides safeguards against trouble on the way up. It is wise to come out if feeling cold.

Never push off from the bottom and speed to the surface. The rapid change in pressure can seriously damage the lungs, and besides a boat or overhanging rock may be directly above.

Use only properly manufactured and well tested equipment. Always test new equipment before entering the water.

Always carry a knife in an accessible position, but see that neither it nor any other piece of equipment is tied on in such a way that it will lead to the diver being caught on rocks or in kelp.

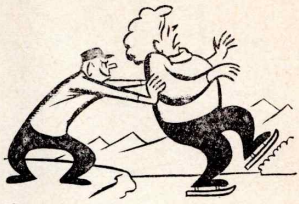
When diving with a lung, the above safety precautions also apply. Additionally, it is recommended that the diver become familiar with the breathing device before entering the water.

Spear fishing must always be conducted well out of the range of bathers with the full spear path in view. A loaded spear gun is lethal and should never be carried around on shore.

Should it be necessary to rescue a snorkel swimmer who is in difficulties, be sure that his mask and snorkel are removed as soon as the surface is reached. If this is not done, and he is turned on his back to be towed shorewards, the end of the snorkel will be under the water and the victim will be deprived of air.

Skater

Because of the intense cold, an ice accident can quickly become a fatal one. Basic safety measures are—



- A person should never venture on to ice unless he is certain that it is sufficiently thick to support him.
- If the ice breaks, a victim should not attempt to scramble about madly, as adopting a swimming position, breaking the thinner ice and moving on to thicker ice with as powerful swimming kick as can be mustered, is more likely to succeed.
- Rescuers should keep clear of the hole, but can help by sliding out a rope weighted by a stick, pushing out a ladder, board or long pole.
- A human chain with rescuers lying on the ice wriggling forward quietly, each gripping the ankles or skates of the one ahead, is a sure means of pulling the victim to safety.

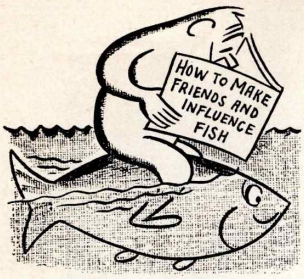
Only basic points have been mentioned under each heading in this chapter. The thoughtful reader can learn more of aids to safety in and near the water by perusing any of the following books and booklets.

Water Safety is Your Business—Issued by the National Water Safety Council.

Safety in Small Craft—Published in conjunction with the Marine Department: Government Printer.

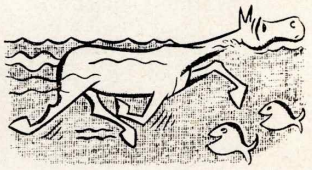
Safety in The Mountains—Published by Federated Mountain Clubs of New Zealand.

PERSONAL SURVIVAL



Man has survived through the ages of living on this earth with its surface mainly water, only because his instinct of self-preservation has made him cautious where water is concerned. But, as the preceding chapter has shown, this instinct which says 'don't get drowned' is not always sufficiently forceful to prevent accidents and the increased use of water as a means of livelihood, transportation, and recreation has brought with it a growing awareness of the dangers involved. In other words, for his personal survival, man has had to think consciously about his safety when in, on, or by the water. Although it is possible that from time immemorial natives of countries bordering tropical seas have had some degree of proficiency in swimming, as we know it today, it is only in the last hundred years or so that man has made a determined effort to overcome the natural hazards associated with water. On the one hand he has learned to swim, first for safety and then for fun, and on the other he has learned to recognise and avoid those situations which could bring his life to an abrupt end by drowning.

Learning to Swim:



Most animals swim naturally, largely because they float easily in their normal land position and with their heads well above the surface, and then have only to 'run' to propel themselves. But with man, swimming is an acquired skill and the strokes which we know today are the results of a long process of evolution. Primitive man paddled across rivers on inflated skins or on narrow rafts of saplings lashed together; modern man sends his children to a swimming pool to be taught swimming and water-safety. But this process of evolution must go on.

for even in this country with its favourable climate and widespread facilities less than half the population is able to swim safely. With more and better facilities for teaching swimming, more teaching and more time, we can move progressively towards the goal of having all except the very young, competent swimmers.

Although 'one stroke at a time' must be the precept of learners, the Society encourages the use of all the swimming strokes in everyday use and requires that candidates for its proficiency awards swim them correctly. As each one in turn is mastered the swimmer becomes more versatile and adaptable in the water and therefore more confident of his ability to save himself or others, should the occasion arise. These strokes are Breast-stroke, Side-stroke, Crawl, Back-crawl, English Back-stroke and Butterfly.

The Breast-stroke:

This is the most useful and seaworthy of all the strokes. Its powerful kick can be readily adapted for propulsion or support, its position with arms and legs apart much of the time and the underwater recovery of arms give stability, and its high head position unobstructed vision and easy breathing. Breast-stroke is unsurpassed for swimming in rough or choppy water, more especially if fully clothed, for making an approach to a drowning person, or when unrestricted vision is all important, as among obstacles or when approaching a landing place. A further advantage is that unlike the other strokes it can be done efficiently under water.

Although historians have found vague records of a primitive dog paddle type of stroke being swum at least 2000 years ago, most authorities agree that it was from Breast-stroke that the other strokes we now use were developed. As far back as 1696 Thevenot described a stroke in which the 'arms pull sideways like the oars in rowing a boat and then recover under water, while the legs kick outwards like a frog'. Today's Breast-stroke, although done in the same flat position with the head held up, is quite different from that of 300 years ago. The 'natural' movements described by Thevenot have been replaced by others more efficient but more difficult to learn.

The arms, from a position straight and together in front of the face, are pressed outwards, downward and backward until they nearly reach a line through the shoulders. They may bend slightly at the elbows during the downward and backward

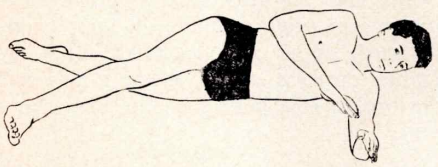
phase. They are then relaxed and recovered, first inward towards the body and then forward. The leg movement is the propulsive unit of the stroke and is by far the most difficult part to learn or teach. From a straight and together position the legs are bent at the knees so that the heels are drawn up towards the buttocks. This is the recovery movement and must be done smoothly with both knees and feet drifting slightly apart. The feet are then turned or rotated outward and moved still further apart. The drive or kick follows with an outward, backward and together thrust all in one rounded movement. Its effectiveness will depend to a great degree upon how well the legs and feet are positioned at the end of the recovery movement. The legs relax and pause briefly when they have been driven together and are then ready for another recovery. The breath is taken through the mouth at the beginning of, during or at the end of the arm drive, the latter being more suitable when the arms make a forceful backward thrust. Arms and legs drive alternately, the leg drive commencing as that of the arms finishes. The long glide after the leg kick and the wide-apart spread of the knees are not features of today's breast-stroke. Breast-stroke in races or in examinations for the Society's higher awards must be done so that—(1) the head is maintained in a forward or downward—but never sideways—looking position in order to keep the body flat and balanced on an even keel throughout; (2) the arms move simultaneously and symmetrically; (3) the legs likewise move simultaneously and symmetrically. Any deviation from these basic principles of good breast-stroke will incur disqualification in the former and failure in the latter.

The Side-stroke:

It is not surprising that the side-stroke developed from the old-fashioned breast-stroke which, with its wide arm stroke and violent kick outward left a lot to be desired as a means of progression in the water. It was found that by turning the head on to one side it was much easier to take breaths, especially in choppy water. This soon brought about a drop of one shoulder and hip and a position with the body half on its side. To accommodate themselves to this new position both arms and legs began to lose the wide-apart characteristic of the parent stroke, the former moving backward and forward in line with the body and the latter developing an action like scissor blades opening and shutting.

Nor is it surprising, in view of this development, that side-stroke has most of the advantages of, and much in common with, breast-stroke. It is easy to do, it permits unrestricted breathing, it gives some degree of forward vision and like breast-stroke its powerful kick is very suitable for life-saving.

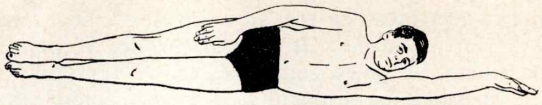
The body lies evenly on one side with the lower side of the face in the water and the eyes directed to the side in order to keep the head in line with the body. The arms work alternately, one making its drive as the other recovers. The lower arm, straight forward and with palm downward, commences its stroke with a press downward and then continues backward with a bend at the elbow until just past the shoulder. It then relaxes and makes its under-water recovery, still with the hand moving parallel with and very close to the centre line of the body. When this lower arm is extended forward the upper arm is extended backward ready to make its under-water recovery to a position close to and just beyond the shoulder. This upper arm then drives backward, also with the hand moving parallel with and very close to the centre line of the body. This arm may be recovered above the surface as in the crawl stroke, the stroke then being over-arm side-stroke. It should be noted that neither arm has, during its drive, any of the lateral pull of breast-stroke.



From a position together and yet one above the other, the legs make their recovery by bending slightly at the knees and then moving apart as if taking a step forward with the upper leg and a step backward with the lower. Just as they reach a comfortable opening, with the lower one slightly further from the centre line than the upper, they are straightened and the feet extended. They are then driven smartly to a feet together position and in doing so thrust the body forward. Both in recovery and drive each leg must move parallel with the surface of the water. The kick can be done, though with less efficiency, with the lower leg recovering forward and the top leg recovering backward, in which case it is called an inverted scissors kick.

Co-ordination of arm and leg movements is important. As the lower arm presses downward into its drive the upper arm

moves forward and the legs open in recovery.

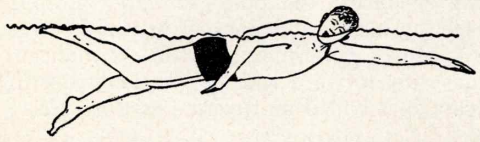


Then as the lower arm in turn moves forward in recovery the upper arm drives backward and the legs kick together. The simultaneous kick and upper arm drive result in an appreciable glide with lower arm forward, upper arm backward and legs together. One breath is taken on each stroke, as the under arm commences its drive. The breath is expelled as this under arm moves forward in recovery.

The Crawl Stroke:

22 The crawl stroke is the fastest yet evolved and, as every second counts, should be used when swimming to the rescue of a drowning person unless the rescuer is hampered by clothes or is conserving his energy for a really long swim. It is the best-known and most widely practised stroke in New Zealand, largely because it is the basic stroke taught in the Primary Schools. Unlike breast-stroke and side-stroke, propulsion comes mainly from the arms. The legs are used to maintain balance and stability, rather than to move the body through the water, and for this reason are of little value in towing a patient. However, the crawl kick, combined with a wide breast-stroke arm movement, can be used when rescuing a tired swimmer or when swimming under water.

The stroke is done with the body flat and the face submerged at least to the level of the eyebrows. Only during the last few yards of an approach to a drowning person, or when forward vision is all-important, should the head be held up. The arms move alternately and continuously, one driving backward under water as the other recovers forward above the surface. Each arm in turn, almost straight or moderately bent, enters the water in front of, or slightly inward from, the shoulder. The drive consists of a continuous press, pull, push of the hand and arm directly backward to a position outside the upper thigh. The hand is bent at the wrist to keep it square to its line of direction; the elbow also shows a slight bend as lower arm and hand traverse a course close to



the centre line of the body. At the end of the drive the arm is relaxed and recovered above the surface, swimmers with loose and supple arms and shoulders bending at the elbow until hand almost touches the armpit and those not so well endowed swinging the arm wider and closer to the surface.

The legs, stretched and with feet in line with the lower legs, move alternately up and down. They swing freely from the hips with a wavy or undulating movement accompanied by considerable flexion at both knees and ankles. Flexibility at the ankle joint is extremely important and requires a great deal of extra kick practice at the learner and intermediate stages. The kick is shallow, hardly exceeding body depth, and is done with the feet just breaking the surface. To get a breath the head has to be turned from its face-down position to one side as the arm on that side is completing its drive backward. After the breath is taken through a wide-open mouth the head returns to its former position where breathing out is done. The usual timing of the stroke is six kicks or beats to the double arm cycle, left leg moving up-down-up as the left arm drives under water and the right leg at the same time moving down-up-down.

The Back-Crawl Stroke:

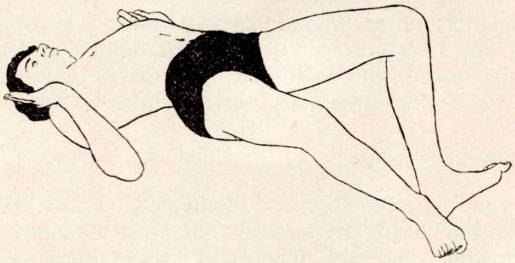
This stroke is a development of the front crawl and is done flat on the back with the head in line with the body and submerged to about the ears. The arms stroke alternately with an above - water recovery and the legs kick as in the front crawl. Each

arm, straight and with the palm of the hand downward, enters the water behind the shoulder and then drives downward and outward to the side of the thigh. It may be straight and pull wide and shallow or bent at the elbow through the middle range of a much deeper drive. The arm swings wide of the shoulder in recovery, seldom exceeding an angle of 45 degrees to the surface, is relaxed and almost straight, with the palm of the hand facing downward. Largely because breathing is unrestricted the stroke is easier than front crawl and is valuable as a change-of-stroke when swimming a long distance. The alternating up and down kick of the legs has insufficient propulsive power to be used as a towing kick in life-saving unless the rescuer is wearing

rubber flippers, in which case it can be used instead of the breast-stroke or scissor kick. The greatest disadvantage of the stroke is that the swimmer is unable to see where he is going.

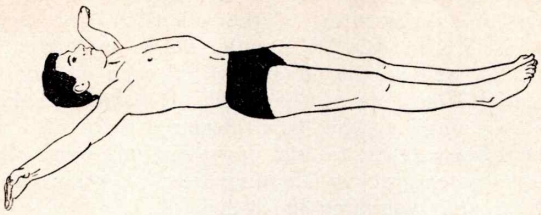
The English Back-stroke:

This stroke has been described as a breast-stroke done on the back and although somewhat old-fashioned can be done very easily by breast-stroke swimmers. It is allowed as an optional stroke in some of the examinations for the Society's awards. The leg movement is the same as in breast-stroke, except that it is done on the back. The arms commence their stroke from a glide position in which they are straight, directly behind the head and with the palms of the hands facing upward and the first fingers touching. The arms drive simultaneously outward



and backward to the thighs and after a brief pause make a simultaneous recovery to the glide position. In recovery they may swing wide and above the surface as in back-crawl or move directly backward at water level. In the latter case the recovery is commenced by bending the arms at the elbows and at the same time moving the upper arms and elbows downward, so that the thumbs almost touch the shoulders in passing.

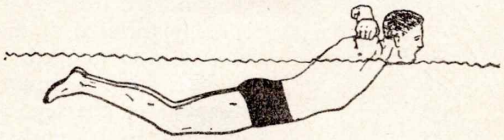
The leg kick is made while the arms move backward in recovery and is followed by a pause while the body, with arms and legs outstretched, glides backward. The legs remain motionless while the arms carry out their lateral pull to the thighs. The breath is taken as the arms complete their pull so as to give the body maximum buoyancy for the simultaneous recovery of arms and legs.



The Butterfly Stroke:

Although the butterfly stroke was originally a breast-stroke it is now a crawl-type movement with only its simultaneous, rather than alternating, arm strokes in common with the stroke from which it evolved little more than thirty years ago. It is a strenuous stroke, suitable only for strong and well-conditioned swimmers, and for this reason is allowed as an optional stroke in the examinations for the two highest of the Society's proficiency awards.

The body position is flat with only a little of the undulating hip movement of the stroke's early years. The leg movement is up and down from the hips as in the crawl BUT with the legs moving simultaneously and not alternately. The ankles must be flexible and the feet turned in slightly on the downward movement so that the knees are slightly apart. The arm movement is also the crawl arm stroke, but again with arms stroking simultaneously and not alternately. Most swimmers have insufficient strength to pull the arms through in a straight line

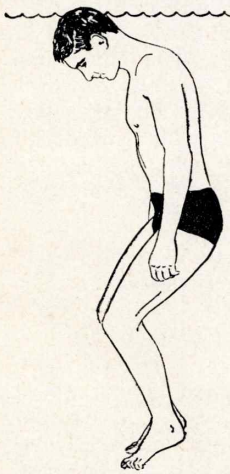


from entry to recovery and find that they have to pull first slightly outward, then inward and then outward again to initiate the fast and practically straight-arm recovery. The breath is taken after the completion of the arm drive, either forward as in breast-stroke or to one side as in crawl. The continuous windmilling action of the arms sets the rhythm of the stroke, the double kick of each stroke adapting itself to the arm movement.

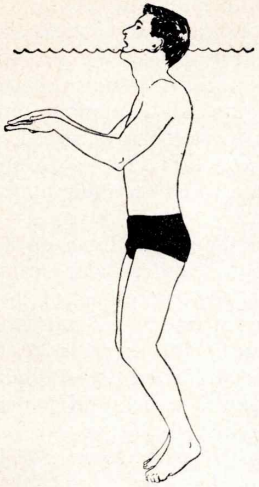
No one should consider himself a proficient swimmer unless able to swim at least three of the above strokes, each for a distance of 200 yards. He should know something of the limitations as well as the advantages of each and be able to change easily from one to the other. He should also, in the course of learning to swim, have mastered such other skills as would be of assistance to him in saving his own life in an emergency, more especially floating, treading water, swimming under water and swimming in clothes.

Floating:

Whether or not an object will float in water depends upon its relative weight and volume. If when completely submerged it displaces a weight of water greater than its own weight it floats. (Actually it sinks until it displaces a weight of water equal to its own weight and then floats at this level.) If the weight of water displaced does not equal its own weight it sinks. With few exceptions the human body, completely immersed in water and with the lungs deflated, will not float.



But if its volume is increased by inflating the lungs it will float, though with only a small portion of its total volume above the surface. The best floating position for survival purposes is with the body more or less upright, the arms hanging loosely by the sides and the head and shoulders drooping forward so that at least the face is submerged. The knees can be raised to counteract any tendency for the legs to rise up backward. In this position relaxed muscles make the minimum demands for oxygen and a normal breath will last at least ten seconds. If, at 10 to 20 second intervals, the arms are slowly raised forward almost to water level and then pressed downward just firmly enough to bring the mouth above the surface adequate breaths can be taken and the body maintained in this position for hours on end.



Only very buoyant persons can float, with arms and legs outstretched and together, horizontally on their backs, but almost all can float vertically, with the arms either at the sides or outstretched sideways, provided that the lungs are kept full by taking one breath on top of another. A basic movement for those learning to swim is floating in a prone or face-down position with arms and legs outstretched and together. It should be noted that if the effective volume-to-weight ratio is increased by wearing some form of life-belt or life-jacket the body will float so much higher in the water that normal breathing can be carried out without restriction and without the risk of swallowing water.

Treading Water:

Although most people can float in an upright position, provided that the lungs are inflated, only the top of the head remains above the surface. However, if arms or legs, or both arms and legs, exert a downward pressure on the water the whole of the head can be held easily above the surface. This is known as treading water and enables a swimmer to come to a standstill to rest, to talk, to look about, to discard clothes or to position himself for taking hold of a drowning person. The legs move as in breast-stroke, side-stroke or crawl, and in this position displace the water downward instead of backward as when swimming. The arms press downward, either alternately, as in dog-paddle, or simultaneously, as in breast-stroke. The movement is easiest with both arms and legs moving. With arms only or legs only it is necessary to stroke faster and pay more attention to breathing, and with arms above the surface, particularly if holding a weight, it is a difficult skill and calls for vigorous stroking of the legs and fully-inflated lungs.

Swimming Under Water:

Ability to swim under water, beneath some obstruction or under a breaking wave, is sometimes necessary to enable a

swimmer to get himself out of a dangerous situation. It is even more necessary in life-saving, as there are many occasions when the victim of a drowning accident is below the surface and an under-water search has to be made. It is not easy to learn, as the natural buoyancy of a swimmer's body brings him to the surface against his will, but once it has been mastered, a distance of twenty yards is easy and one of fifty yards not beyond the ability of a good swimmer able to tolerate a moderate oxygen debt.

Unless the swimmer is wearing rubber flippers and can do an under-arm crawl stroke, the best stroke for under-water swimming is breast-stroke, preferably with one or other of the following modifications. Ordinary breast-stroke is all right, as is breast-stroke with a scissor kick, but if the arm stroke is continued right back to the thighs and followed by a slight pause before the kick is done, the stroke is easier and faster. This stroke is similar to the English Back-stroke (page 24) but is done, of course, in the prone position. The second modification of breast-stroke is a stroke with this same long arm strokes much more suitable than crawl, back crawl or butterfly. stroke combined with a continuous flutter of the legs (Crawl leg kick, page 22).

Swimming under water is allowed as an alternative to the surface dive, when a suitable depth of water is not available, in examinations for the Elementary Certificate, Intermediate Star, Bronze Medallion and Bronze Cross. It is a compulsory requirement in examinations for the Award of Merit, Distinction Award and Diploma.

Swimming in Clothes:

Every swimmer may at some time be involved in an accident which precipitates him suddenly and fully dressed into deep water. If he knows what this feels like and how much clothes, particularly outer garments and shoes, impair his ability as a swimmer he is not likely to panic and add to the confusion. For a short time the air trapped in clothes assists buoyancy and enables the swimmer to take stock of the situation without having the feeling of being dragged down. But as this air bubbles away, the weight of the clothes pulls him deeper in the water where resistance to forward progression is greater and breathing more difficult. He will find that the slower stroking and under water arm recoveries of breast-stroke and side-stroke make these strokes much more suitable than crawl, back crawl or butterfly. If he has to swim any appreciable distance he will find progress

much easier and faster if he discards his shoes and at least outer garments. Shoes are best removed in a face-under-water position, one knee at a time being drawn up nearly to the nose so that the shoe may be unfastened and removed. Other garments should be removed in either a treading water or survival floating position, with smooth unhurried movements that do little to tire the swimmer or disturb his body position. Shoes first, then lower, then upper garments is the general rule, except in the case of a heavy coat, which should be removed first. Trousers or skirt should be undone at the top, slid down to the knees and then 'stepped out of' as on land. Garments which have to be removed over the head should first be gathered under the armpits and then lifted over the head with face tilted forward, or, alternatively, have one arm withdrawn, then the head and then the other arm.

Undressing

Some garments, particularly when made of strong, closely-woven material, can be artificially inflated to provide additional buoyancy in an emergency. A shirt, a skirt, a dress or a pair of trousers may be prepared by having one end fastened—the ends of both legs in the case of trousers—and then inflated by being swung through the air so that the garment fills up. This can be done either before or after immersion. The trapped air will gradually escape, even if little weight is put on the improvised support, but it can be replaced if the swimmer is able to submerge his head and blow bubbles into the open end, which has been loosely gathered in one hand.

Taking Care:

Of those people who learn to swim most do so as children in the calm and clear water of a swimming pool and under the watchful eyes of parents or teachers. At least half of these children learn in a shallow pool where the bottom is always within easy reach of their feet. Here they may learn the basic skills of keeping up in the water and moving in any desired direction, but they cannot learn how to adapt their newly acquired ability to the very different conditions that they will experience in rivers and the sea. The more fortunate are those who have available a deep-water pool and are taught the deep-

water skills of survival floating, treading water, jumping and diving from a height and swimming under water. As it is impossible to gain deep-water confidence in shallow water, every effort should be made to get learners into deep water, under supervision, of course, as soon as they have reached the necessary stage of proficiency.

Non-swimmers who bathe in open waters should always keep a reasonable margin of safety between themselves and deep water or the rips and currents which could carry them off their feet. They should be especially cautious at unfamiliar bathing places and should never go in alone. It is just as important that the good swimmer take note of conditions and keep in hand that same margin of safety which will see him home even if that last wave is bigger than all the others or the current is so much stronger than it appeared to be. Like the non-swimmer, he will leave the water at the first sign of fatigue or cold and not risk dangerous exhaustion or cramp.

Note Conditions

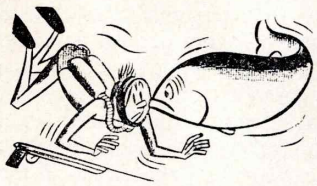
At a beach patrolled by a surf life-saving club, both non swimmer and swimmer will enter and stay between the red-and-yellow flags marking the safest area. For the former there is safety in numbers and confidence in the thought that trained life-savers are watching over him. For the latter, who is probably quite sure that nothing could happen to him, there is the satisfaction of knowing that he is setting a good example and is on hand to help or signal for help should somebody get into trouble. Away from patrolled areas care must be taken to choose the safest place, preferably where others are bathing. An even roll on a surf beach, provided that it is not too big, usually indicates good conditions; a broken surf indicates channels or cross-currents and a dumping surf gives warning of a foothold-robbing back-wash. At many places it is safer to bathe on an incoming tide which is nearing its peak rather than on an outgoing one approaching low water. Surf skis and surf boards should be left alone by all except strong swimmers, and inflatable rafts, toys and swimming aids should be looked upon as if designed to float the unwary into deep water and danger, more especially if an off-shore wind is blowing.

Patrolled Beaches

Lakes and river pools which shelve easily to deep water are safer than those with steep sides and are less likely to encourage diving where under-water hazards abound. Fast-flowing, unbridged rivers, the cause of most drownings in New Zealand's early years, should always be crossed with extreme care. Even a good swimmer will take time to find the best place for crossing, will use a line if possible, and whether swimming or wading will never fight against the current but use it to help himself across. If on horseback he will consider also the animal's temperament and experience before attempting a crossing. He will be prepared to slide out of the saddle on the upstream side as soon as the horse is swimming and then lie flat alongside and guide it gently towards the best landing place.

Crossing Rivers

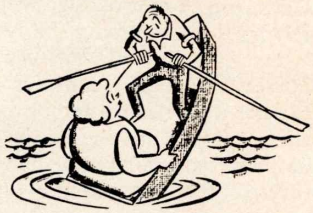
Those whose recreation is by the water, like fishermen and surf-casters, on it, like water skiers, or under it like skin divers, must also be on their guard against untimely death by drowning. They also should make a practice of keeping in hand that reasonable margin of safety with which to meet any mishap or unforseen situation. Spear fishing and skin diving with the aid of self-contained breathing apparatus have additional hazards and should not be indulged in by the novice except under competent supervision. The established underwater clubs all provide for the training of newcomers to the sport and insist on safety precautions and the correct use of equipment. It is a matter for regret that there is nothing to stop a beginner from purchasing equipment and trying his luck, perhaps alone, with no regard for the potential danger.



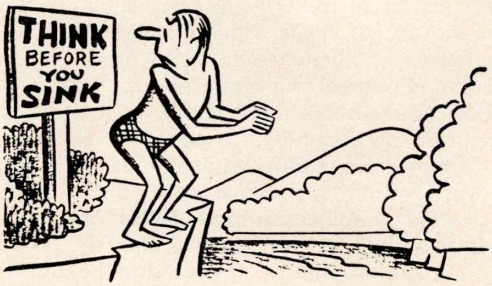
Nearly a quarter of all drowning accidents in New Zealand arise from the use of boats, canoes and yachts for sport and recreation. Most of these would have been avoided if those concerned had observed two simple rules, firstly, to stay with a disabled or capsized boat until unable to hold on to it without risk of injury, and secondly, to see that adequate personal buoyancy equipment is readily available and that life-jackets are worn whenever circumstances call for their use. Even a good swimmer can survive for only a limited time in a rough or choppy sea, largely because of the difficulty of breathing, but an upside-down boat, a life-buoy or

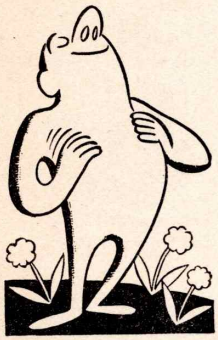
Boating

life-jacket will not only hold him high enough in the water to breathe freely without exhausting himself by swimming or treading water but also make him much easier seen by those who are in a position to rescue him from his predicament. However, most boating accidents can be avoided altogether if reasonable care is taken. Those whose fun is ON the water should know who of their party can and who can not swim. They should know the safe capacity of their craft, its suitability for the job in hand and have checked that all equipment is in place and in good repair. They should know too, the simple rules of seamanship, how to improvise a sea anchor and how to rescue a person who has fallen overboard. And if petrol is used aboard for any purpose, they MUST know and observe the special precautions against fire and explosion.



From the above it should be clear that personal safety on, in or under the water is largely a matter of being careful to avoid mishaps and yet at the same time being prepared to cope with those that do occur. But it is not enough to know safety procedures; they must be carried out at all times and in all places. 'Look before you leap' should be taken to mean 'THINK before you jump, dive or fall into water'. Take heed of the advice of those qualified to give it. Local bodies and life-saving clubs do not erect warning notices lightheartedly. Ability to read can save lives when the notice reads 'No bathing allowed here—dangerous quicksands'.



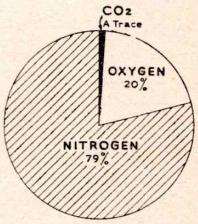


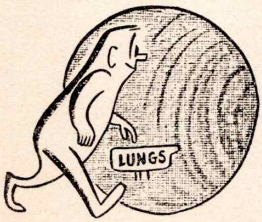
A BREATH OF FRESH AIR

Take a breath of fresh air. Let us see where it goes and what effect it has on our bodies.

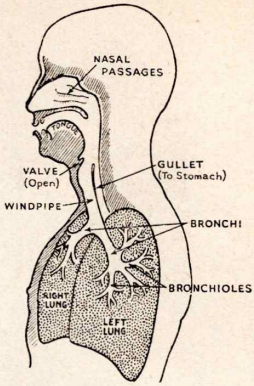
The air around us is made up of a mixture of gases—Nitrogen 79 per cent., Oxygen 20 per cent., and a trace of Carbon Dioxide. The oxygen is the gas that really interests us because, without it, life as we know it, would not exist.

Come, and we will take the fascinating journey with the breath of air on the return trip to our lungs. The journey starts through the nose, where air conditioning begins with the trapping of large dust particles by the hairs in the nostrils, or it may start through the mouth, where the air cleaning system doesn't have this refinement. A warming and humidifying process is continuous from the moment the air enters the passages. Blood vessels near the surface of the special tissue (mucous membrane) lining these air passages, provide the heat, and special glands, the moisture, some of which remains to trap and hold fine dust particles still in the air.

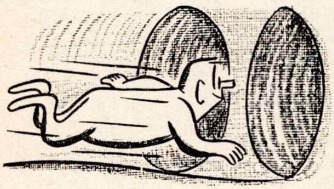




The inward journey is a rapid one, with the air speeding down past the back of the tongue into the windpipe, which is guarded by a special valve designed to close when we swallow. It wouldn't do to have soup trickling down the wind pipe (trachea), would it?



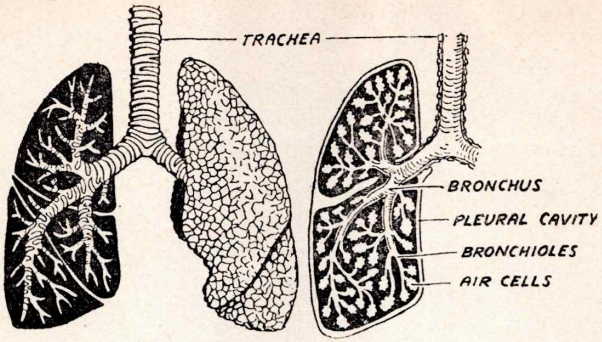
If you run your finger down the front of your neck, you can feel the approximate position of this valve just above your Adam's apple. A little lower you will feel the hard "C" shaped rings of cartilage in the walls of the wind pipe which ensure that this part of the route is always open.



As we follow the air down the wind pipe, we come to a place where there is a division, giving two tubes (bronchi) for the air to travel along. Air cleaning is completed by the lining of these tubes, a fine fuzz of moist threadlike hairs that arrest the remaining particles of foreign matter, and by their movement, sweep them up towards the wind pipe and away from the lungs. Each of the bronchi, still with stiffened walls, conducts the air to its respective lung.

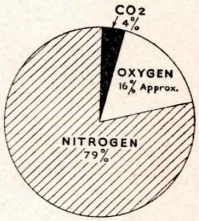
Lungs

At the entrance to the lungs, the bronchi divide to form the bronchial tubes, and we see more frequent and more numerous divisions of these tubes as the air passes deeper into the lungs. By now the tubes are finer and more elastic, so that they can move with the lungs as they expand to accommodate the incoming air. This branching continues much like a tree's branches, becoming finer, until there are twigs ending, not in leaves, but groups of air sacs. In these air sacs (alveoli), the inward journey finishes, the fresh air



sharing its oxygen with the air already in them, and in turn taking a share of the carbon dioxide in the air it meets there. The air sacs, which always have some air in them, give the lungs their "foam rubber" texture.

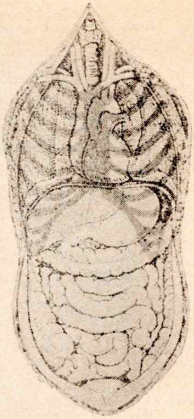
Out goes the air after its brief stay in the lungs, the return journey being along the same route, terminating at the mouth or nose where it is exhaled as a slightly different combination of gases—Nitrogen 79 per cent., Oxygen about 16 per cent., and Carbon Dioxide 4-5 per cent.

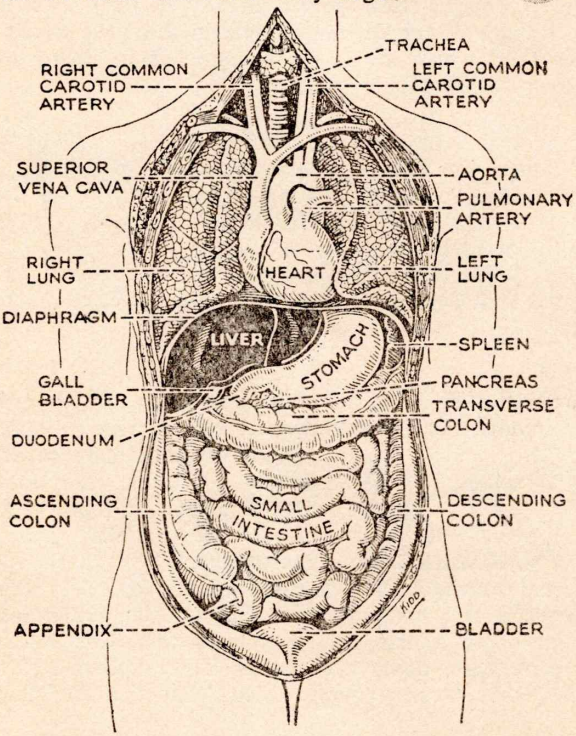


When resting or doing light exercise, we breathe about twenty times a minute, but as our exercise becomes more strenuous, the amount of air we take in with each breath increases, as does our breathing rate. In fact, the amount of air we breathe varies from approximately five quarts a minute for normal activity to 120 quarts a minute for really strenuous exercise such as a running race. The amazing lungs and their air conditioning system can cope with this wide range with comparative ease, doing even better if we undertake training. Normally they work at only a small fraction of their total capacity.

It seems that the air has been rushing in and out of our lungs just because we desire that it should, and have a need for the oxygen it contains. Some physical force must cause the vital air exchange and, as this is not as simple as some people suppose, we will see just what happens.

Our lungs and heart are safely encased in a cage of ribs, those moderately flexible bones that run from our back bone and join the breast bone at the front. Above, the collar bone and shoulders give them protection, and below, a very strong muscle layer, the diaphragm, stretches like a floor to the chest cavity, and separates it from the stomach and other body organs.





Our light breathing occurs because our diaphragm, while really not a flat floor but curved a little upwards, curves further upwards, makes the space in the chest smaller, and pushes some air out. Its return to the "flat" position increases the volume of the chest, creates a slight vacuum, and air rushes in at atmospheric pressure to reduce the vacuum. This type of breathing goes on without our thinking about it, and is the way we breathe when asleep.

Breathing

After even a little exercise, the amount of air provided by the diaphragm's movement does not supply enough oxygen for the body, so the muscles between the ribs are called into play. One set of muscles pulls the ribs up, increases the chest volume, and permits much more air to be breathed in. Then another set of muscles between the ribs pulls them down and, combined with the diaphragm's action, squeezes this extra air out of the lungs.

The lungs would not be happy about this expanding and contracting, if they were not enclosed in air tight bags, with lubricating fluid in them to allow the outside of these elastic spongy organs to glide freely as they fill with air.

A DROP OF BLOOD

Red and sticky — would you describe a drop of blood like that? You could, if you didn't look at it too closely. However, we are going to see what is in a drop of blood that makes this liquid so important to us. For our purposes, it can be said that the blood is made up of red cells, white cells, and plasma.

The red cells are minute discs dented in on both sides, and in that drop of blood from a pin prick, about 150 million of them find room to tumble about. These cells can very quickly pick up oxygen and release carbon dioxide, a characteristic which we shall soon see, is vital to us.

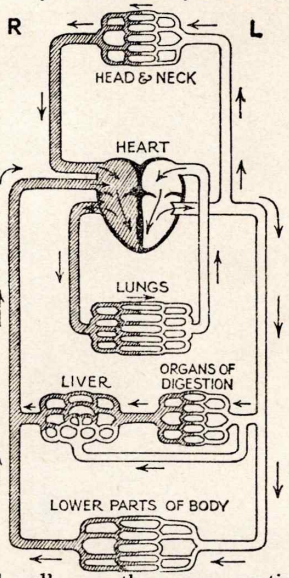
Red Cells

In contrast to the red, the white cells, the shock troops of the body, are larger and only about 300,000 will be present in

White Cells

that same drop of blood. Bacteria and even dust in the tissues is absorbed and made harmless by the white cells, which you may have seen as pus surrounding a splinter in your finger.

To carry the cells along the 40,000 miles of blood vessels, is a clear liquid known as plasma, and, although 90 per cent. water, it controls the stickiness of the blood and helps it to clot, so that a cut finger does not completely drain the system.



Let us follow a drop of blood as it surges along the short main blood vessel from the heart (aorta) past the first branch supplying the head, neck and arms, to the downward branching artery leading to the organs in the area below the chest, and to the legs. The drop rushes on, urged by the pressure of the heart's beat, and aided by the muscular layer in the arteries' walls which allows this pulse to be felt when arteries run near the surface, as they do in some parts of the body.

Arteries

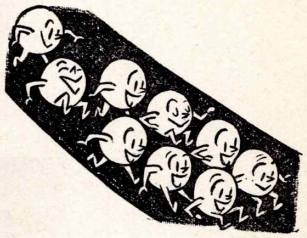
It is a hard life for the blood cells, as they are continually jostling each other, and bumping into the walls of their vessels, especially as these become narrower as the journey progresses. The finest arteries (arterioles) eventually divide into capillaries, so narrow that the cells have to arrange themselves in single file to squirm and twist their way through. When in these microscopically narrow passages with progress so slow, about 1/200th of an inch a second compared with the rushing 7-inches a second in the aorta at the journey's commencement, the oxygen from the red cells is exchanged for carbon

Arterioles & Capillaries

dioxide from the tissues, which also absorb nutriment from the other components of the blood.

Now the less brightly coloured red cells, with their loads of carbon dioxide, find the going easier as they emerge into the comparatively wide vessels, the still slender veins, and later into the larger veins. Different in character from the arteries, the veins have practically no muscular tissue in their walls, and act as pipes to return the blood to the heart. As the blood has virtually no pressure of its own, having been slowed down by the capillaries, it is propelled back by the squeezing effect of the muscles of the legs and stomach, and the diaphragm. Our little drop must move up towards the heart because the veins have valves to prevent any return flow. As the blood collects from more and more veins, its speed builds up and it enters the heart at much the same speed as it left it in the aorta

Veins

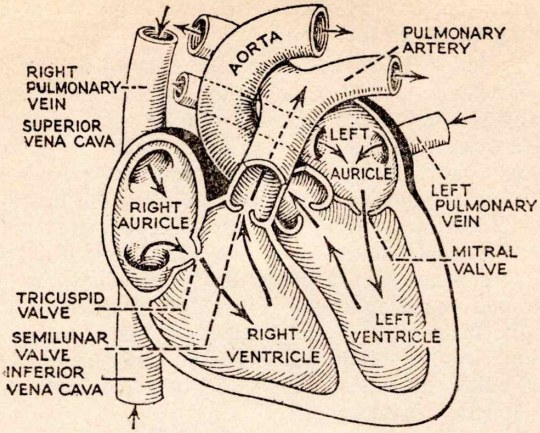


The story of the journey to the head and arms is the same in principle as the one to the lower part of the body, except that the return to the heart is greatly aided because it is "downhill". The entire circuit of the body during normal light exercise takes about one minute; a shorter period, of course, when we undertake strenuous exercise.

Come and look at the wonderful pump which works unceasingly for our entire life. It rides comfortably between the lungs, and is a little off centre to the left of the breast bone. Something of a pear shape, it has four compartments, two on each side, one above another, with the upper connected to the lower, but no way of getting directly from one side to the other.

We left our drop of blood with its red cells laden with carbon dioxide on the point of entering the upper room (right auricle) on the right side of the heart. There it goes, through an opening guarded by a one way valve, into the lower compartment (right ventricle) which, with a powerful squeeze, forces it through another valve and along an artery to the lungs (pulmonary artery), where again, the branching system is used to divide the blood vessels until capillaries line the tissue thin walls of the air sacs.

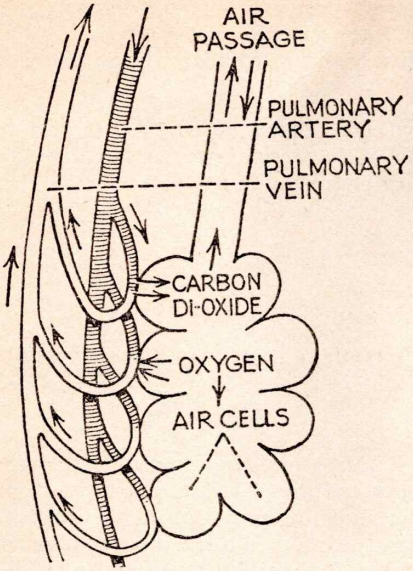
Heart



On its return from the lungs by way of the pulmonary vein, the blood is fully charged with oxygen, is bright red, and this time enters the top compartment on the left side of the heart (left auricle), from where it is pushed into the lower chamber (left ventricle), whose thick muscular walls when they squeeze, speed the blood past a non-return valve into the aorta, and so off on another circuit of the body.

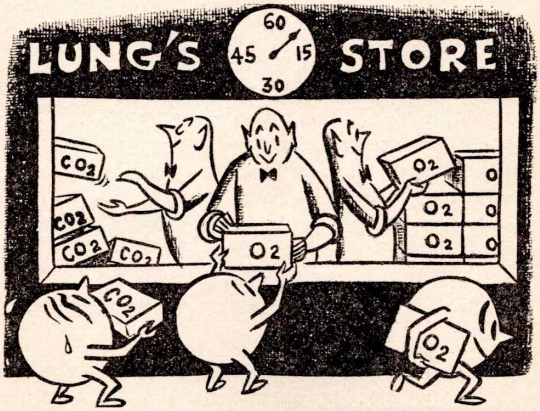
So that the blood is pushed from the upper to the lower compartments, the auricles, with their muscular walls, contract for about one-tenth of a second at the beginning of the heart beat, and then the much thicker muscular walls of the ventricles contract, pumping the blood along their respective systems, one to the lungs and the other around the body. It is the latter part of the heart's action, taking just under one-half of a second, that can be felt as a pulse at the wrists, in the neck, and at other pressure points. On an average, the heart repeats this cycle 72 times a minute.

While we are aware that the blood returning from the lungs is bright red and charged with oxygen, we seem to have overlooked how this comes about. We will retrace our steps and see what happens in the lungs.



You will remember how the blood is pumped out of the right ventricle along an artery to the lungs. Once near the lungs, the artery branches in a simliar manner to the air passages, firstly dividing into two, and then quickly branching until the microscopic capillaries line the wafer thin walls of the air sacs. In these also there is room for only one red cell to pass at a time, so we have a single layer of blood cells spread around this porous membrane. As the combined area of all the air sacs amounts to approximately 1,000 square feet, equal to about half a tennis court, there is, at all times, a thin film of blood of this size, one cell deep, exposed to the air in the lungs. Each cell has only one second to exchange its carbon dioxide for oxygen, and the red cells accomplish this because of their large

Oxygen Exchange



surface area and the excellent properties of the haemoglobin (the red chemical compound of which they are composed), which quickly absorbs oxygen that has diffused through the air sacs' walls.

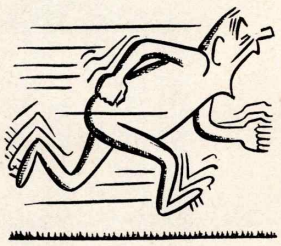
Once loaded with oxygen, the cells make way for those next in line, passing into veins of increasing size as the blood is gathered from the lungs to flow to the left auricle.

MESSAGES FROM THE BRAIN

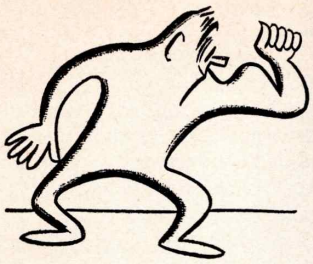
This astonishing system of breathing and the orderly progress of blood around the body, transferring oxygen and carbon dioxide as required, is controlled by the brain by way of the nervous system.

Breathing

A message is sent regularly from the brain to the muscles which control our breathing, so that without any conscious effort on our part, an adequate supply of oxygen is in our lungs. However, should the carbon dioxide level increase, even as little as two-tenths of one per cent., the change is detected by a sensitive nerve centre in the brain, and immediately a message is sent to the muscles of the chest to increase the amount of air drawn into the lungs until the carbon dioxide level is restored to normal. Even moderate exercise brings about a raised carbon dioxide level, accounting for the more rapid and deeper breaths we take when we run.



If we wish to move an arm or leg, or write, our brain sends a command along the appropriate nerves which stimulate the



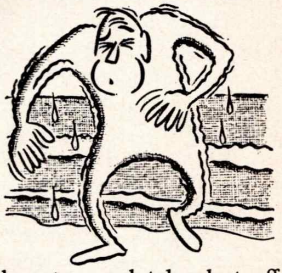
muscles to make the limb move. A shortening and thickening of the muscle fibres brings about the movement. You are well aware of this action when you flex your arm. See how the muscles of your upper arm thicken. Oxygen combining with chemicals in the muscle tissues, produces the energy required, and results in carbon dioxide and heat being left among the waste products.

Running, for instance, demands more work by leg muscles, and consequently more oxygen, so another set of nerves transmits this information to the brain. The oxygen shortage in this area is quickly overcome, as the little arterioles (remember them?) carrying blood to the working muscles, respond to the instruction to increase their diameter and let more blood into the capillaries coursing through the muscle tissue. The increased blood flow also removes the extra carbon dioxide.

Muscles

The greater the number of muscles working, the more heat is produced, and if it were not for our cooling system, our temperature would quickly rise above our normal 98.4 degrees Fahrenheit. Continually we are losing heat to the air around us, the amount lost depending largely on the quantity of blood flowing through the skin, and the air temperature. Again we see the arterioles, being ordered to pass a greater volume of blood, this time into the capillaries of the skin, to allow us to cool down, and almost completely shut off this part of the system when we are cold. Shivering, by the way, is an effort by the brain to make a number of muscles work solely for the sake of their heating effect.

Heat Control



An appreciation of this complex and wondrous system will allow you to understand how important oxygen is in sustaining life, the effect of resuscitation methods, and how best to apply them.

ASPHYXIA

It is the oxygen in the air we breathe that maintains life. With the first breath after man's birth, life begins, and with the last breath, it ends. Breathing and life are so closely interdependent that, when breathing stops accidentally and interrupts the supply of life-giving oxygen, every effort must be made to restore it.

Whenever the oxygen supply to the body is interrupted for more than a minute or two, a state of asphyxia develops and, unless respiration is restored, death will result. The oxygen required to maintain life is absorbed from the air through the lungs into the blood and is carried by the blood to the tissues. Similarly the carbon dioxide produced by the combustion of this oxygen, is carried by the blood from the tissues to the lungs. Some of the oxygen in the air breathed in, passes by diffusion through the thin walls of the air sacs or alveoli of the lungs into the tiny blood vessels which surround them and through which five to six quarts of blood flow each minute.

Any impairment to breathing reduces the amount of oxygen in the alveolar air and increases the amount of carbon dioxide, so that the blood takes up too little oxygen and gives off too little carbon dioxide. As a result, carbon dioxide accumulates in the blood and, since the nerve centre for respiration in the brain is stimulated by carbon dioxide, the rate and depth of breathing are greatly increased. This condition is known as Dyspnoea, which means "difficult breathing". Should the impairment continue, the excess of carbon dioxide in the blood eventually causes the respiration centre of the brain to cease functioning. Breathing then stops and a state of asphyxia is produced.

Asphyxia

The heart may continue beating for a short time after breathing has ceased, but it too, will soon stop, and unless respiration is resumed, either artificially or naturally, within a few minutes, death results. Interruption to the supply of oxygen to the brain for as little as three minutes usually results in a permanent damage.

Cases of drowning are usually complicated by water entering the lungs. In most of them, the victim "breathes in" water instead of air, so partially flooding the lungs and depriving the body of oxygen, but in others, the first drop of water inhaled, causes a spasm of the muscles of the larynx in the throat, mechanically blocking the air passage. This condition is altered when unconsciousness overcomes the victim, and only then can water enter the lungs.

Drowning

Owing to the extremely large surface of the tissues in the lungs, fresh water is rapidly absorbed into the blood stream, diluting it, and so reducing the oxygen-carrying capacity of the blood. In fresh water drowning, failure of the circulation swiftly follows the cessation of breathing. A rescuer must, therefore, be on the alert for dilated fixed pupils of the eyes, and for lack of pulse, indicating the need for External Cardiac Resuscitation to maintain the circulation of blood while respiration is being restored.

Fresh Water

In salt water drowning, the density of the water being greater than that of the blood, fluid is drawn from the blood stream into the water-logged air sacs, so reducing the volume of the air space in the lungs and the amount of circulating blood.

Salt Water

During the short period that the heart continues beating and the blood pressure remains nearly normal, the chance of successful resuscitation is good. Once the blood pressure falls below a certain point through heart failure brought about by the gradual lack of oxygen, no amount of artificial respiration will restore life.

The development of symptoms of asphyxia depends upon the degree and the duration of the oxygen deficiency, and upon the rapidity with which it is developed. Even slight degrees of deficiency of oxygen impair the co-ordinating capacity of the nervous system. In sudden and acute asphyxia, such as that from inhalation of pure nitrogen, or of a high concentration of carbon monoxide or hydrocyanic acid gas, unconsciousness is immediate, and the victim may die within a few minutes. When asphyxia develops gradually, the victim passes through a succession of stages, ranging from the first barely perceptible impairment of behaviour and self-control, up to death through the failure of respiration and the fibrillation, or stand-still, with dilation of the heart.

Symptoms of Asphyxia

The most obvious signs of asphyxia are the blue-grey appearance of the skin, especially of the face and ears, and the intense swelling of the great veins, particularly those at the base of the neck. The most common ways in which asphyxia is caused, are obstruction of the air passages as in suffocation, strangulation and drowning, or an electric shock, powerful enough to cause paralysis of the respiratory centre. In these cases, artificial

Signs of Asphyxia

respiration, if applied in time, may effect restoration by re-introducing a supply of air into the lungs, so that sufficient oxygen is again taken into the blood, and the excess of carbon dioxide removed.

It is imperative that quick action be taken. NOT ONE SECOND MUST BE WASTED. The sooner artificial respiration is started, the greater is the prospect of success. Precious time must not be wasted in moving a victim further than necessary, or in attending to minor injuries. The chance of revival from respiratory failure, in relation to time is clearly shown here.

Time in Minutes	Chance of Recovery
1	96 per cent
2	90 per cent
3	75 per cent
4	50 per cent
5	25 per cent

Causes of Asphyxia

The deficiency of oxygen which causes asphyxia may arise from any of the following general types of external conditions:

(1) By conditions which prevent breathing, such as submersion in water, burial under earth, by a cord around the neck, or by food caught in the throat.

(2) By electric shock, or by narcotic and anaesthetic drugs which depress the respiratory centre to the point of failure.

(3) By gases, such as nitrogen, methane, hydrogen, etc., which exclude oxygen, or by great altitudes where barometric pressures fall so low that the partial pressure of oxygen is insufficient to support life.

(4) By carbon monoxide which, even when present in small amounts in otherwise normal air, may combine with the haemoglobin of the blood and thereby decrease correspondingly its capacity to carry oxygen from the lungs to the tissues.

(5) By cyanides which, by combining with chemical compounds in the tissues, deprive them of the capacity to use oxygen for the maintenance of their vital combustion.

The capacity of the body to liberate energy and do work, or even to maintain a minimal activity, is largely determined by its capacity to obtain oxygen from the air, carry it to the tissues and there consume it. A decrease of this capacity is the most outstanding feature of old age. In most deaths, whatever the preliminary stages, the final events are asphyxial through failure of respiration, circulation, or some other related function.

ARTIFICIAL RESPIRATION

A person becomes asphyxiated if he is unable to breathe for himself, and the restoration of his natural breathing by outside assistance is known as Artificial Respiration.

His inability to breathe ends the intake of oxygen, and his brain, the centre of the nervous system, quickly suffers permanent damage. It is necessary, therefore, to commence artificial respiration with extreme urgency, as the first two or three minutes are vital to recovery. All treatment, other than stopping of arterial bleeding must be carried out after breathing is restored, or by other people.

In doing artificial respiration, it is necessary to—

(1) Waste no time.

(2) Keep calm.

(3) Decide quickly the method of artificial respiration to be used.

Many methods of artificial respiration have been popular over the years, the Society having taught the Schafer and Holger Nielsen methods before adopting the present Expired Air method. As the Expired Air method may not be suitable for use in all cases of asphyxia, the Society teaches also a less effective manual method, the Silvester (Chest Pressure Arm Lift) method. Air is exchanged in this method by forceful expulsion from the lungs followed by muscular expansion of the chest to draw the air in.

Everybody should be able to do artificial respiration, as no one knows when he may be called on to use it to save a life. The easiest method to both learn and do is the Expired Air method. No resuscitation method is effective unless there is—

(1) A clear air passage. (2) An adequate supply of oxygen.

These two requirements are admirably fulfilled by the Expired Air method.

To do Expired Air Resuscitation—

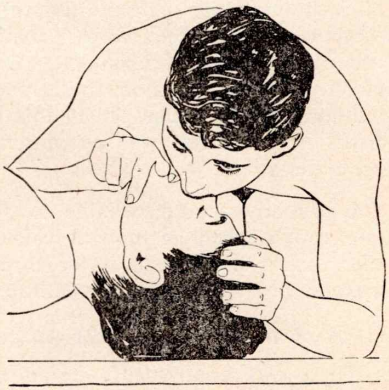
(1) Lay the victim on his back. If on a slope, have the stomach somewhat lower than the chest.

(2) Ensure that the mouth and throat are free from obstructions. If necessary, wipe out the mouth with the fingers, preferably covered by a handkerchief.

(3) Give the victim's head the maximum backward tilt so that the chin is prominent and the neck

stretched to give a clear airway.

(4) Open your mouth wide, make an airtight seal over the nose and blow. The victim's mouth can be blocked by your cheek or by sealing the lips with the thumb of the hand supporting the chin.



(5) Or, if his nasal passage is blocked, open your mouth wide, make an airtight seal over his mouth and blow.

(6) Remove your mouth from the victim's face and allow the air to escape. Turning his lower lip back helps.

(7) Commence the resuscitation with ten quick deep inflations of the victim's chest to give a rapid build up of oxygen in his blood and then slow down to approximately twelve to fifteen respirations per minute, taking your timing from the deflation of his chest.

With small children and babies, inflation of the chest is done by a series of small controlled puffs, each one ceasing when the chest STARTS to rise. UNDER NO CIRCUMSTANCES BLOW VIOLENTLY INTO A BABY'S LUNGS.

EXPIRED AIR RESUSCITATION is easy to do. Lengthy practice is not essential as the operator can—

FEEL the air going in,

SEE the chest rise, and

HEAR the air being exhaled.

The operator has both hands free to maintain a clear airway while resuscitation is being done. When the victim has his head tilted backward, his tongue is drawn forward so that the air passage at the back of the mouth is clear.

The expired air of the operator contains approximately 16 per cent. of oxygen, and this amount is adequate to supply the needs of the victim. The ten quick deep breaths with which resuscitation is commenced, restores the oxygen level in the victim's blood to 95 per cent. of normal. The volume of air exchanged is more important than rhythm. Twelve good breaths a minute

are adequate, whether they be regular or not. Between breaths, tight clothing, particularly around the neck, can be loosened. If the operator feels giddy, he may slow down a little. Even a small operator can breathe for a large victim for a long time without fatigue.

The operator, being at the victim's head, is in the best position to watch him closely and be prepared to cope with water or food which may be expelled from his stomach. This is more likely to occur when he is a victim of drowning. To avoid this danger, place the victim so that his chest is higher than his stomach, and his head lower than his chest. In this position, fluid will be more likely to remain in his stomach, but if it should be expelled, then it will more easily drain from the throat, rather than entering the lungs. As an added precaution, should gurgling noises be heard, turn the victim quickly on to one shoulder with his head still tilted backwards and lower than his chest. This will assist in the draining of fluids from the body. Do not worry about water in the body in the first instance. The important thing is to get air into the lungs quickly.

Position Victim

If the blowing in the mouth-to-mouth method is too vigorous, air may enter the victim's stomach causing it to bulge. By blowing through his nose, this hazard can be overcome, but in this case, slightly part his lips with your thumb as the chest deflates because exhalation is often easier through the mouth than through the nose.

It is vitally important to commence resuscitation as soon as possible and the Expired Air Method can be started immediately the rescuer reaches the victim, even in deep water or a similar awkward place, where an initial exchange of air should be made before moving him to a better position.

The advantages of Expired Air Resuscitation are—

Resuscitation can be commenced immediately, even in the water, because it is not necessary for the victim to be placed on the ground.

The operator can get oxygen to victim's lungs faster than by any other known emergency method of artificial respiration.

He is in an ideal position to observe the victim's face and breathing.

Both of his hands are free to keep the air passage open.

He can feel the air go in, see the chest rise, and hear the air exhaled.

He has big reserves of air and strength for inflating the victim's lungs.

He can control the vigour of his efforts to suit the size of the victim.

He can continue for hours without exhaustion.

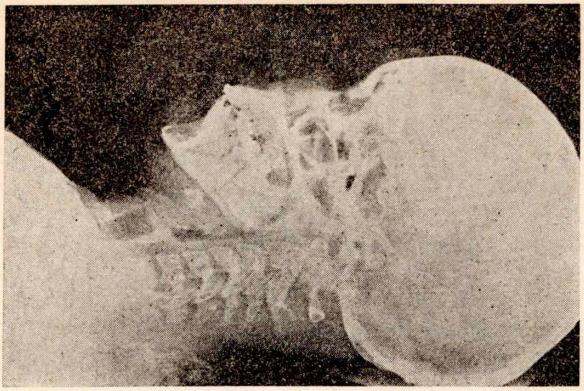
A small operator can breathe for a large victim.

No special equipment is needed.

As the use of Expired Air Resuscitation in demonstration and practice may be objected to on hygienic grounds, artificial means may be used to demonstrate the method. A mask may be put over the patient's face, or a dummy patient, into which air is blown, used instead of a live one.

It must be stressed, however, that in an actual rescue, there must be "contact" between the operator's lips and the victim's face, although a clean handkerchief or cloth can be used between the two faces if desired.

There are available several types of manual and mechanical air pumps which force air into the victim's lungs, but these, like the tubes through which air or oxygen is blown into the victim by the operator, should be used only by skilled and experienced people.

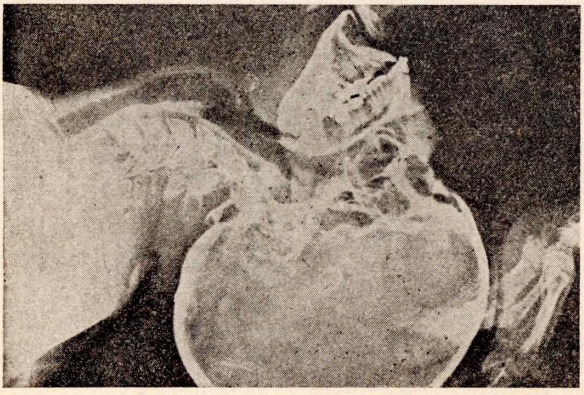


These two reproductions from X-ray plates graphically illustrate the necessary manipulation of the victim's head before any form of artificial respiration can be successful.

The upper plate is of an unconscious person in a normal position, lying on his back. It can be clearly seen how the grey patch of the tongue has all but closed the air passage behind and below the lower jaw.

Look now at the lower illustration of the same person. See how the tongue is carried forward with the jaw and the air passage to the lungs is wide and clear because the head is tilted backward as far as it will go.

No method of resuscitation can be effective without a clear air passage.



DRILL FOR EXPIRED AIR RESUSCITATION

The object of this drill is to teach the treatment for restoring respiration, ONLY up to the stage where mouth-to-nose or mouth-to-mouth contact would be made. For hygienic and aesthetic reasons, the actual blowing of air into the patient's lungs is not to be done in practice. A resuscitation trainer (page 57) is available, which permits the practice of blowing into a face mask on the patient. The result can be seen in the inflatable "lung" on the patient's chest.

The member of the class on the right of each pair will act as patient and the other as operator.

If it is necessary to re-form the class for this drill, the members will form up in single rank according to height and stand at ease.

One or more ranks may be formed, but care should be taken to leave a clear space of at least 6 feet between each rank.

Atten—tion

Right—Dress

Eyes—Front

In Twos—Number

Form Two—Deep

From Right—Extend

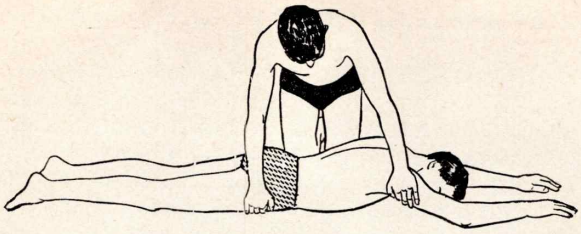
Re-Form

Should it be desired to cover the floor in order to protect the clothing of the members of the class, the Instructor will give the command—"For Resuscitation—Prepare"—on which each number "two" will place a mat or towels covering the area of 6 feet by 3 feet in front of number "one's" position, and then resume his position in line.

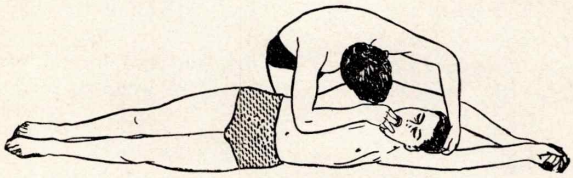
FOR RESUSCITATION—READY.

Number One will kneel, going first on his left knee and then on his right, fall forward on his hands before lying full length, face downward, with his head turned to the right and his arms stretched above his head.

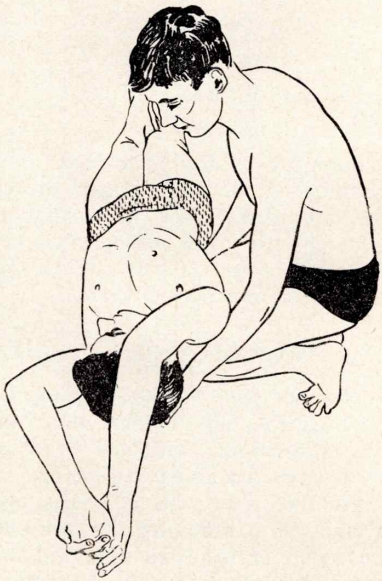
Number Two will simultaneously move forward and, with a right turn, kneel on the left side of the patient in line with the small of the back. He will then take hold of the patient's right shoulder with his left hand and the right hip with his

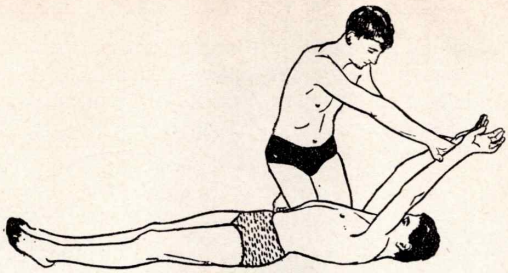


right hand. With a steady pull with both arms, the patient will be rolled on to his side and supported against the thighs; the operator then quickly inspects the mouth to ensure that

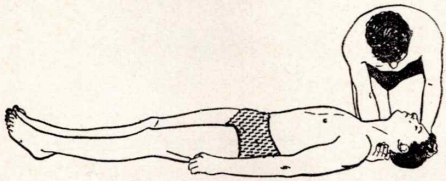


nothing is blocking the air passage. The rolling movement is then continued and, as the patient is about to swing over on to his back, the operator's left hand is pushed forward so that the patient's right shoulder rests on the forearm and the head on the palm, while the right hand will loosen its grip and slide beneath the hip. When his arms have taken this fresh hold, the operator will adjust his kneeling position, complete the turn on to the back, and move the patient's arms to his side

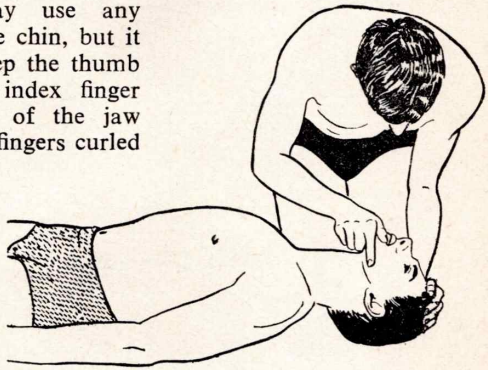




Still facing the patient, the operator will move on his knees until he is in line with the head. With his right hand under the patient's neck and his left on the top of the head, he then lifts the neck and tilts the head backward as far as possible. The



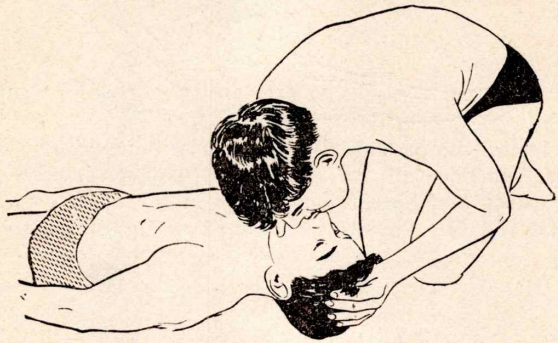
patient's chin is then gripped by the thumb and first finger of the operator's right hand. Both hands are then used to ensure that the maximum backward tilt of the head has been achieved. The operator may use any suitable grip on the chin, but it is preferable to keep the thumb on the chin, the index finger following the line of the jaw and the remaining fingers curled into the palm so that they support the chin. He must be sure that there is no pressure exerted on the throat.



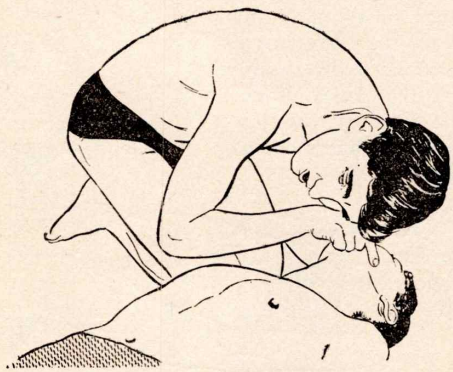
The whole time he is getting the patient into position for Expired Air resuscitation, the operator will breathe as deeply as possible in order to build up the amount of oxygen in his lungs and remove more carbon dioxide from his blood.

MOUTH TO NOSE RESUSCITATION—COMMENCE.

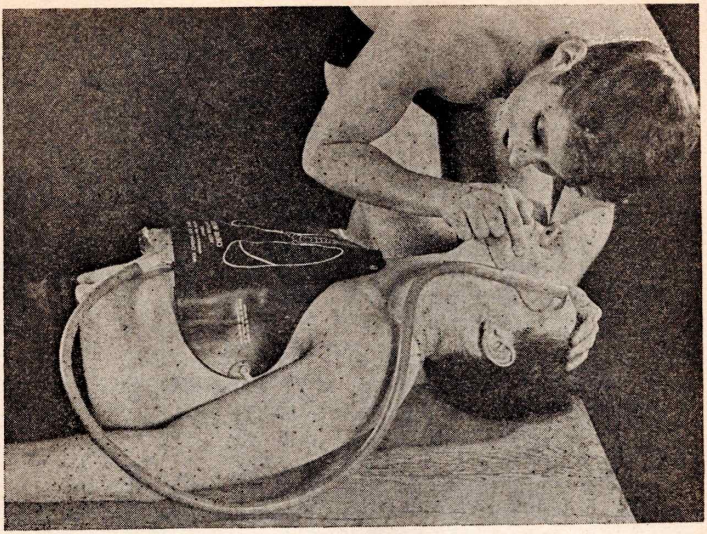
On this command, leaning just beyond the patient's left cheek and with his chin touching the patient's nose tip, the operator will carry out the breathing movements of Expired Air Resuscitation for at least one minute. He will take a deep breath, open



his mouth wide and breathe out strongly and steadily. If, as is recommended, the drill is practised with a resuscitation trainer, he will take a deep breath, open his mouth wide, make an airtight seal around the nose of the mask which is resting on the patient's face, and blow. In both cases he will then immediately turn his head to the right so that he can watch



the patient's chest fall, and at the same time inhale deeply. The first ten breaths must be as deep and as rapid as possible, after which a rate of twelve to fifteen times a minute should be maintained.



An inexpensive resuscitation trainer in use.

RESUSCITATION—HALT.

The operator will cease the breathing movements of Expired Air Resuscitation.

ON TO SIDE—TURN.

To simulate dealing with vomit, the operator will raise the patient's right shoulder and so turn the upper part of the body on to its side, supporting it on his right thigh. In this position the head will be lower than the chest and the motions of clearing the mouth and throat may be shown.

RESUME—POSITION.

On this command, the operator will lower the patient on to his back, supporting the right shoulder with his right hand while he moves his right knee and using his left hand to support the head. He will then resume operating position, making sure that the patient's head is given the maximum tilt backward.

MOUTH TO MOUTH RESUSCITATION—COMMENCE.

The mouth-to-mouth method will now be demonstrated by the operator who will seal his mouth around the mouth of the mask. The thumb of the right hand will be used to pull the lower lip down while still maintaining the pressure on the lower jaw with the fingers.

If a mask or trainer is not being used, the operator will, while maintaining the maximum head tilt with the patient's jaws still together, pull down the lower lip with the thumb of his right hand, and breathe out leaning over so that his mouth is beyond the patient's mouth which should be directly below the operator's chin.

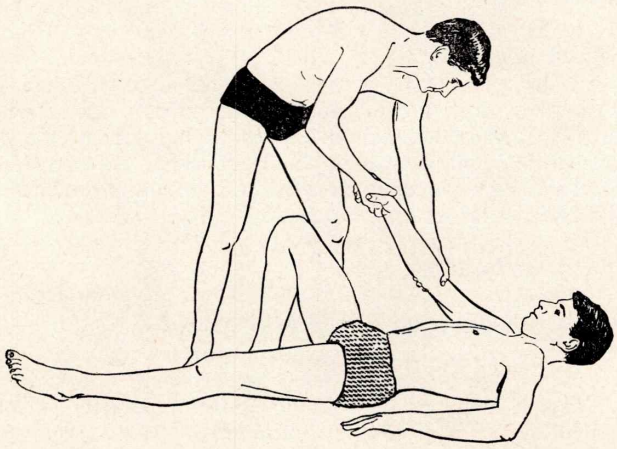
In all other respects mouth-to-mouth resuscitation will be done the same way as mouth-to-nose. It will be continued at the rate of twelve to fifteen times a minute for at least one minute.

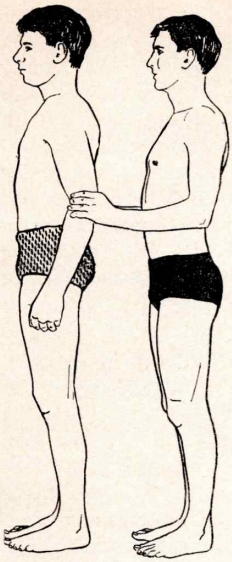
RESUSCITATION—HALT.

On this command, the operator will cease the breathing movements of Expired Air Resuscitation and move on his knees to a position level with the patient's hips and still facing him.

RE-FORM.

On the command RE-, the operator turns towards the patient's head and stands up. The patient places the palm of his left hand on the ground, raises his right arm and bends his right





knee so that this foot also is flat on the ground. With his left hand, the operator takes hold of the patient's raised arm just above the elbow. Both operator and patient grasp one another with their right hands.

On the command -FORM, the operator, with the patient assisting by pressing down with his left hand, helps him get up and then slips in behind him and takes hold of his arms just above the elbows. He then releases this grip and steps up to either the right or left of the patient, depending upon whether he in turn is to be the patient or is to resume his Number Two position. Both then turn about to face the front.

DRILL FOR THE SILVESTER METHOD

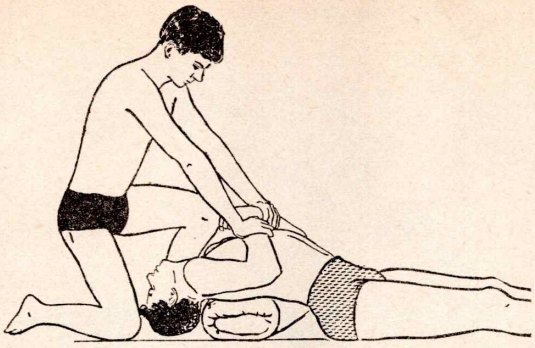
Accidents with insecticides, noxious gases, and corrosive poisons, can cause asphyxia and, provided that the victim's mouth and nose are wiped clean, attempts to restore breathing can be made by using the Mouth to Nose technique. The operator should be sure to keep his head well away as the victim of gas poisoning exhales. There are also accidents which cause facial injuries when Expired Air Resuscitation could be more difficult to do. A fully trained life saver will be able to assess the situation that confronts him, and, so that he does not stand helpless in unlikely circumstances that preclude the use of Expired Air Resuscitation, he should be able to perform correctly the less effective manual method, Silvester. The drill for this method is as follows, with any necessary preliminary drill the same as for the Expired Air Method (page 53).

FOR RESUSCITATION—READY.

Number One will kneel, going first on his left knee and then on his right, fall forward on his hands before lying full length,

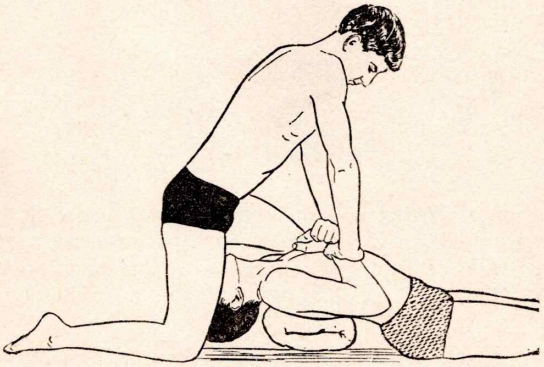
face downward, with his head turned to the right and his arms stretched above his head. Number Two, who will be equipped with suitable padding (i.e. two bulky rolled towels, folded coat, or folded light rug) will simultaneously move forward and, with a right turn, kneel on the left side of the patient in line with the small of the back. He will place the padding in a position which he estimates will correspond with the patient's shoulder blades when lying on his back. The operator will then take hold of the patient's right shoulder with his left hand and the right hip with his right hand. With a steady pull with both arms, the patient will be rolled on to his side and supported against the thighs of the operator who will then quickly inspect the mouth to ensure that nothing is blocking the air passage, and finally adjust the position of the padding. The rolling movement is then continued, and as the patient is about to swing over on to his back, the operator's left hand is pushed forward so that the patient's right shoulder rests on his forearm and the head on his palm, while the right hand will loosen its grip and slide beneath the hip. When his hands have taken this fresh hold, the operator will adjust his kneeling position, complete the turn on to the back, and move the patient's arms to his side. THE PADDING SHOULD BE THICK ENOUGH TO ENSURE THAT THE TOP OF THE PATIENT'S HEAD IS BARELY TOUCHING THE GROUND.

The operator will move quickly to the head of the patient and kneel on the right knee, which must be just clear of the top of the patient's head and in line with his right ear. The left foot will be placed with the toes slightly to the left of, and level with, the patient's left shoulder. The operator will grasp the patient's wrists and cross them one over the other above the lower end of the breast bone.



RESUSCITATION—COMMENCE.
ONE (EXPIRATION)

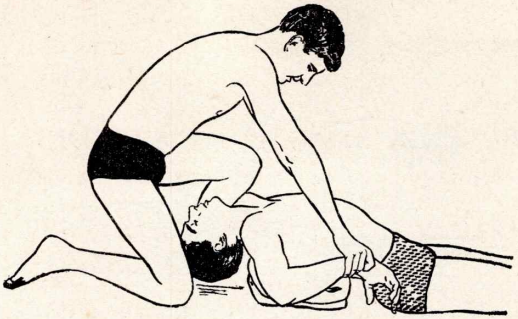
The operator rocks the weight of his trunk gently forward on his straight arms until they are vertical, and by doing so he exerts a smooth, gentle, evenly increasing pressure from above, downward on the patient's chest, using no force whatever and



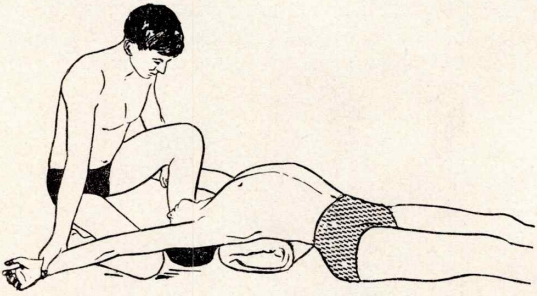
taking care not to bend his arms. A pressure of 22 to 30 lbs. for an adult, 12 to 14 lbs. for children and slight women, and 2 to 4 lbs. for infants is sufficient.

He then rocks his trunk backward, releasing the pressure, and lifting the arms from the chest.

TWO-THREE (INSPIRATION)



The patient's arm movement is continued outwards with a semi-circular sweep until they are extended above his head.



The movement is carried out smoothly and generally parallel with the ground, and is terminated as slight resistance is felt.

The patient's arms must not be forced to the ground when in the extended position as injury may result.

FOUR-FIVE (EXPIRATION COMMENCES).

The patient's arms are then returned along the same route and placed in their original position on his chest. With the timing of one second for chest pressure, two seconds for raising the arms and two seconds for returning them, the complete cycle is done in five seconds or at the rate of twelve times a minute.

RESUSCITATION—HALT.

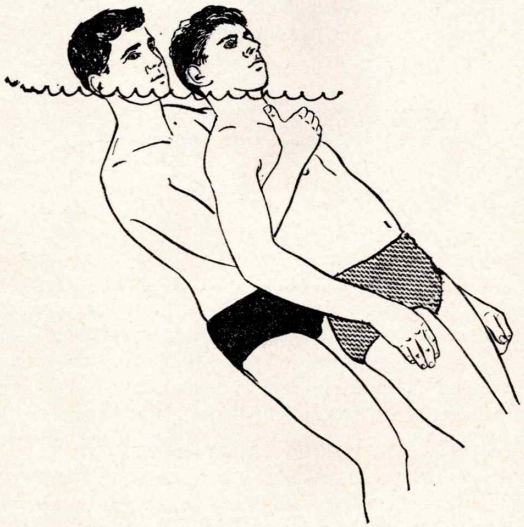
On this command, the operator will complete the movement he is doing, place the patient's arms by his sides and stand up.
RE—FORM.

On this command, the operator will move to the right of the patient, turn about and then help him get up and into line as described on page 58.

EXPIRED AIR RESUSCITATION IN THE WATER

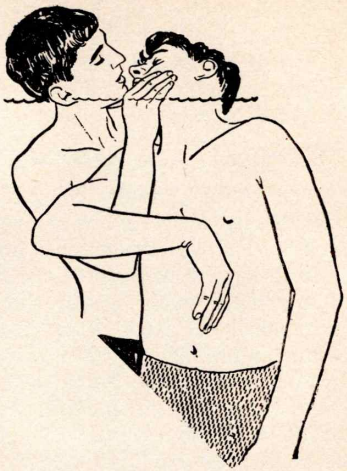
Every effort should be made to supply life-giving oxygen immediately a victim of drowning is brought to the surface. Such a victim of drowning who has sunk from the surface has done so largely because of the loss of air from his lungs, and in consequence, would readily sink again if the rescuer's hold was momentarily relaxed. Even if the rescuer has had a strenuous swim, his breath will have an adequate amount of oxygen in it for the victim. One breath is better than none.

To carry out the method, the rescuer remains on his back towing with his ordinary life saving kick, the patient also on his back. The rescuer's right arm is placed under the patient's right armpit with his right hand cupped under the chin so that



thumb and forefinger are in a position to keep the patient's mouth closed. His left hand is either at his side to assist

the rescue, or transferred to a position at the back but near the top of the patient's head to turn it into position for Expired Air Resuscitation and hold it there. The rescuer, with his right hand, turns the patient's face towards his own, making sure the patient's mouth remains closed. Without coming to a stand-still, and without leaning over his patient and submerging him, the rescuer places his mouth over the patient's nose, which should remain above water. He gives four or five "breaths" and then continues normal towing, repeating the procedure every ten to twenty yards.



It must be emphasised that this Expired Air Resuscitation in the water, should be attempted only by experienced and fit swimmers, and that if the rescuer finds that he cannot support the patient confidently, he should proceed with the rescue on its own.

As soon as a firm footing is obtained in chest depth water, Expired Air Resuscitation should be continued while the rescuer gradually floats his victim shorewards.

ASSISTANCE

While artificial respiration is being done, any assistance available should be used to help the patient recover. It is most important to send for a doctor and an ambulance.

If dry clothing or blankets are available, they should be wrapped around the patient to conserve his body heat. It is just as important to protect him underneath as it is to cover him. Hot water bottles should not be used to warm him up, as external heat draws blood to the skin from the vital organs where it is urgently needed.

An assistant can also be asked to make sure that there is no tight clothing around the neck, chest or waist, likely to restrict breathing.

RECOVERY

When a person begins to be revived by artificial respiration, the first signs are usually a gulp or sigh as he endeavours to breathe. There may be a fluttering of the eyelids, or a gradual change in the colour of the face from blue-grey to one more normal.

As spontaneous breathing movements are resumed, artificial respiration should not be stopped but used to assist the patient with his own breathing efforts. If the operator is doing the Expired Air method, he must watch the patient's chest, and when this commences to expand, breathe into the nose or mouth. This is not easy to do, and the operator has to be very careful to breathe into the patient as the patient endeavours to breathe in for himself.

In many cases of resuscitation following drowning, the patient vomits, and this is usually brought about by the amount of water that a drowned person has in his stomach. It is for this reason that wherever possible, the patient is placed so that his chest is higher than his stomach. When a patient vomits, the vomitus can block the air passage to the lungs at the back of the mouth. If he does, Expired Air Resuscitation must be stopped temporarily, his face turned to the side and the vomitus cleared out of the mouth with a handkerchief or piece of cloth. If this is not done, the vomitus will be blown down and block his air passage when the rescuer continues resuscitation, and he will be asphyxiated a second time. During Expired Air Resuscitation, air may enter the patient's stomach and make him vomit. This is more likely to happen with mouth-to-mouth than with mouth-to-nose contact, particularly if the operator blows in too strongly. On no account should this air be forced out by pressing on the patient's stomach, as this would most likely make him vomit.

SHOCK

A person whose life has been in danger, or who has suffered severe injury, is likely to develop shock. This may be fatal unless proper treatment, which may include a blood transfusion or surgery, is given. Shock may develop at once, or its onset may be delayed, and for this reason, a person who has suffered an experience which may give rise to shock, should be sent to hospital or placed under medical supervision, although he may appear normal and act rationally.

Shock is a condition of severe depression of the vital functions of the body due to the loss of body fluid and lowered blood pressure, which may vary from temporary weakness of the circulatory system to its complete failure. In appearance, a person suffering from shock is pale, his skin is cold and clammy, and beads of sweat may appear on his forehead and elsewhere. He may look worried, or have a vacant stare, and may be restless and fidgety. His pulse is likely to be rapid and feeble, and his breathing rapid and shallow. He may complain of thirst.

CARE OF A SHOCKED PATIENT

Although the treatment of shock requires expert medical attention, first aid while waiting for an ambulance or medical help, will lessen its dangers. The patient should not be moved unless this is necessary to get him to a safe place. If he is conscious, he should be laid on his back with nothing extra under his head. If he is unconscious, or vomiting, he should be gently rolled on to his side so that his tongue will fall forward and the vomit run out of his mouth instead of being drawn into his lungs.

The patient should not be undressed, but any tight clothing around the neck, chest and waist should be loosened if this has not already been done while applying artificial respiration. He should be covered if the weather is cold, but no attempt made to warm him by massage or by the application of artificial heat in any form.

If the patient has no serious external injury and there is no reason to suppose that he has suffered an internal injury which may necessitate surgery on his arrival in hospital, he may, if he complains of thirst, be given small quantities of water, coffee, or tea, but alcohol or other stimulants should NOT be given. If there is any external injury, or if an internal injury is suspected, the patient should not be given anything to drink because this may cause delay in his treatment on arrival in hospital, if this involves surgery and the use of anaesthetics.

When caring for a patient suffering from shock, quiet confidence should be displayed and care taken not to discuss the patient's condition unless well out of earshot.

The condition of shock described above must not be confused with electric shock which is referred to elsewhere in this book.

SECONDARY PNEUMONIA

A frequent complication after successful resuscitation from drowning, is secondary pneumonia. When water enters a patient's lungs, it is impossible to get all of it out, and in a very short time secondary pneumonia may develop where the water has lodged.

A more serious condition results from vomitus entering the lungs and affecting them by its corosive action. Immediate medical treatment is essential.

REMOVAL OF PATIENT

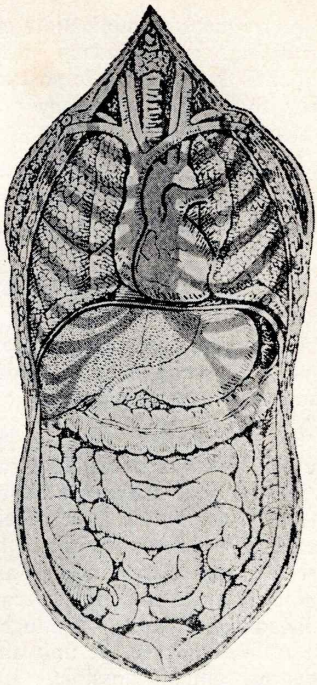
Unnecessary handling or the removal of a patient too soon from the scene of an accident, can counteract any previous successful resuscitation and cause his death.

On no account should a patient who is not breathing, be moved unless artificial respiration can be continued while this is being done. Although Expired Air Resuscitation can be done —and in the event of there being no equipment available, should be done—while a patient is being moved, it is much better to use the resuscitation unit of an ambulance to administer oxygen on the way to hospital. Because 100 per cent. oxygen is available, oxygen therapy is much more effective than Expired Air Resuscitation, and the unit and its trained operator should take over as soon as possible.

A person who has been asphyxiated and is restored to normal breathing, must be considered as being critically ill. Even if he feels well and wishes to continue normal activity, he should be dissuaded from so doing. A short spell in hospital under observation will ensure that the recovery is permanent, for, should any secondary complications arise, the trained medical staff on hand can correctly deal with any eventuality.

Remember that a victim of asphyxia must either be accompanied to hospital or kept under medical supervision at home. If it has been necessary to use External Cardiac Resuscitation as well as Expired Air Resuscitation, admission to hospital is imperative.

EXTERNAL CARDIAC RESUSCITATION



The chest (or thorax) is bounded in front by the breast bone (or sternum), behind by the spine, below by the diaphragm, and is encircled by the ribs. It contains the heart and lungs. With a patient on his back on a hard surface, pressure exerted on the breast bone compresses the heart against the spine, circulating the blood in the main arteries of the body. The lungs are also compressed by this movement, but there is no significant exchange of air. When pressure is released, the chambers of the heart refill from the veins. Rhythmic compression of the heart in this way is called External Cardiac Resuscitation.

In some cases of asphyxia, Expired Air Resuscitation is not always adequate. It should be used in conjunction with External Cardiac Resuscitation which can restore the circulation of the blood when the heart is at a standstill or is in a condition of ventricular fibrillation. Ventricular fibrillation is the term used when the rhythmic pulsating movement of the heart has been replaced by a disorganised fluttering of the heart muscles, and in this condition, the heart ceases to operate as a blood pump. Without oxygenated blood, the brain is very soon damaged, resulting in the death of the patient.

Heart standstill, and particularly ventricular fibrillation, can occur when the patient has lost consciousness as a result of electric shock or drowning.

It is desirable, therefore, that as many as possible know how to do External Cardiac Resuscitation correctly. However, unless properly instructed in the correct application of the technique,

it is unwise to attempt it, for there is a danger of causing internal injuries if an incorrect method is used.

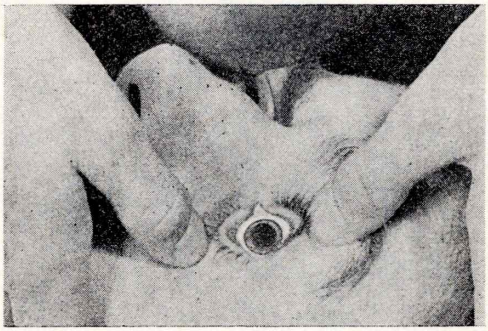
Candidates for the Society's Advanced Resuscitation Certificate Distinction Award and Diploma have to demonstrate External Cardiac Resuscitation and answer questions thereon. They are required to apply only token pressure on a live patient but full pressure when using a Manikin.

External Cardiac Resuscitation must always be combined with Expired Air Resuscitation. It is best carried out by two operators, but can be done by one. Remember that in all cases requiring resuscitation, IMMEDIATE ACTION IS ESSENTIAL. Proceed as follows:

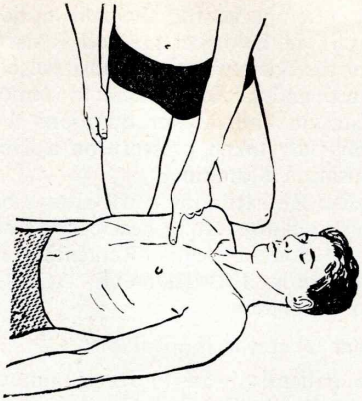
When only one operator is available:

(1) Extend the patient's head to its maximum tilt and commence Expired Air Resuscitation, giving ten quick deep breaths.

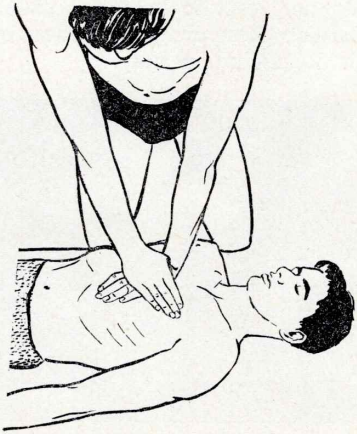
(2) If there is no reaction, such as an improvement in skin colour, feel alongside and slightly behind the Adams Apple for the carotid pulse. Should there be no detectable pulse, examine the pupils of the eyes. If they are enlarged and fixed and do not react to light, the patient is in need of External Cardiac Resuscitation. Otherwise continue with Expired Air Resuscitation only.



(3) Should External Cardiac Resuscitation be necessary, lay the patient face upward on a hard surface, and take up a comfortable position, kneeling with knees apart, alongside him with your body in line with his neck. Remember to continue Expired Air Resuscitation while getting ready.



(4) Place the heel of one of your hands a little lower than the middle point of the breast bone.

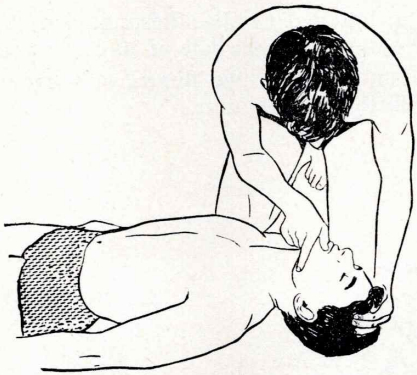


(5) Place the other hand over this hand and depress the breast bone by applying pressure with a short quick movement, keeping your arms straight. The breast bone should be depressed about 1½ inches, but much depends on the age

and build of the patient. Use caution until the recoil of the chest following its compression, is felt.

(6) Release pressure without removing the hands, and repeat the manoeuvre fifteen times in fifteen seconds. Even if you are as big as the patient, this is hard work.

(7) Lean towards the patient's head and give two more breaths by the Expired Air method, each one as soon as the chest has deflated.



(8) Return your hands to the pressure position and perform External Cardiac Resuscitation at the rate of one compression a second alternately with Expired Air Resuscitation—fifteen compressions, then two breaths.

(9) Carry on until the patient shows signs of recovery. Then stop External Cardiac Resuscitation and continue Expired Air Resuscitation until the patient can breathe for himself.

(10) If the patient shows no sign of recovery, carry on Expired Air Resuscitation and External Cardiac Resuscitation until medical help arrives.

(11) Ensure that the patient is admitted to hospital as soon as possible.

When two operators are present:

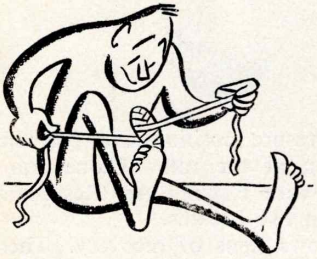
The one performing Expired Air Resuscitation takes up a position at the patient's head, while the other one kneels on the opposite side of the patient in line with his chest. After the first operator has given ten quick breaths, the other applies five chest pressure movements, followed by a further breath administered by the first one. This cycle of five pressure movements and one breath, is maintained as long as necessary. Pressure is not applied to the chest while the breath is being given, so

that External Cardiac Resuscitation will not interfere with the effectiveness of Expired Air Resuscitation.

The position of the patient can be improved and his chance of recovery increased, by raising his legs to an angle of 60 degrees from the ground, and this can be done by one of the operators or, in the case of a single operator, by a bystander, provided that there is available something that can be used for the purpose.

With a child, External Cardiac Resuscitation should be done with only one hand and at the rate of 80 compressions a minute.

With an infant or baby, two fingers only should be used at the rate of 100 to 120 a minute.



ELEMENTARY FIRST AID

"Whomsoever you see in distress recognise in him a fellow man."

There are many forms of distress, other than drowning, with which a good life saver should be able to deal. To help a fellow man is a rewarding experience, and to be able to do this competently, a life saver is well advised to study the book "First Aid", the authorised manual of the St. John Ambulance Association, St. Andrews Ambulance Association, and the British Red Cross.

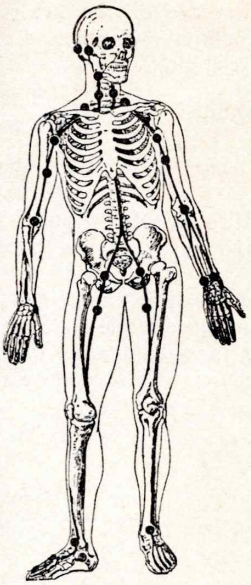
Some basic points, however, are easily remembered, and are set out below. Firstly in an emergency, don't panic, but do quickly what is necessary. As soon as possible, see that a doctor and an ambulance are summoned.

Asphyxia

Many forms of accident as well as drowning, can result in absence of breathing movements. In all cases where it is obvious breathing has ceased, artificial respiration should be applied without a moment's delay.

Bleeding, if present, should be stopped, either by a pad pressed firmly over a wound or, if blood is pulsing out, by pressure on arteries in which the blood flow to the wound can be halted (see diagram of pressure points).

Bleeding



An accident victim should not be moved unless it is to avoid further injury, to position head and neck for Expired Air Resuscitation, or to immobilise a limb. This instruction is of vital importance, especially if the head or limbs are in an unusual posture indicating either a fracture or dislocation. Cover him to retain his body heat and to make him as comfortable as possible. Resist the temptation to make him "comfortable" by placing a pad or pillow under his head as this could be a fatal kindness in a case of spinal injury or if he should lapse into unconsciousness. However, it may be necessary to position a pad under his shoulders to allow him to breathe for himself.

Don't Move Victim

Burns, including severe sunburn, should not be touched but covered with a dry sterile bandage or clean linen. Blisters should not be broken nor should burnt clothing be removed. Medical help should be sought except in **very minor** cases, when large quantities of weak sugar-sweetened tea should be given. Painful sunburn can be avoided by gradually increasing the sunbathing time each day.

Burns

Recovery from electric shock can be complicated by a fall or burns, and the victim can suffer both of these as well as asphyxia. Before attempting to apply Expired Air Resuscitation, be sure that he is not still in contact with the power supply. If he is, shut it off at the switch, pull out the plug, or else pull him clear by using rubber gloves or thick dry clothing. A dry board or stick is a convenient aid to moving the victim. Once he is safe, apply

Electric Shock

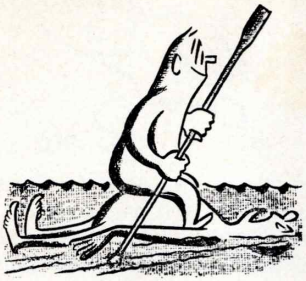
artificial respiration if breathing has stopped. After the first ten breaths, separate the eyelids to check the pupils of the eyes. If they are dilated (wide open) and do not react to light, apply External Cardiac Resuscitation as well as Expired Air Resuscitation.

Shock

The recommended treatment for shock, in the medical sense, is described on page 65.

Blue Bottle Stings

The sea creature that causes most discomfort to bathers in New Zealand waters is the Blue Bottle (Portugese Man-of-War), causing red weals on the skin that has touched its long tenticles. The best treatment is to rub the affected area with dry sand as soon as possible, and then swab it with methylated spirits. In a person allergic to certain natural toxins, the effect of the sting is far greater than described and can be most distressing to the victim who should be treated as for shock (page 65).

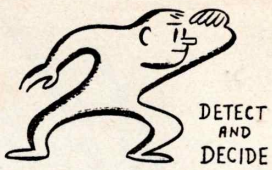


SAVING OTHERS

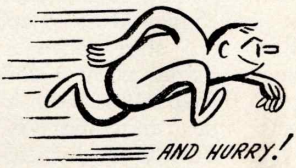
Drowning accidents are infinite in their variety but they all have in common circumstances which render the victim in imminent danger of death through having his supply of air cut off by water. They range from the mass accident of a shipwreck when hundreds of people are likely to go down with the stricken ship to the individual one when the victim, unconscious as the result of a fall or being thrown out in a car accident, lies with face submerged in water little more than an inch deep. In the former case one can help most by keeping calm and encouraging others to do the same in the knowledge that life-saving equipment is provided for such an emergency and that search and rescue operations are probably already under way. If in the water, floating objects can be held or pushed to those who cannot readily support themselves. Such people can be encouraged and urged to conserve their energy until help arrives. In the latter case, provided that the victim's breathing has not stopped, one has only to lift or turn his face until mouth and nose are above water to save a life from drowning.

In these two extreme cases, as in ALL cases where death by drowning is a likely result of an accident, clear thinking and the ability to make a swift appraisal of all relevant circumstances is most necessary. The first link in the chain that prevents the victim passing beyond mortal aid is detection. Most people just stand and stare when a small boat capsizes, when a child falls off a river-bank or when a bather gets into difficulties in deep water. But the trained life-saver, or even the non-swimmer who has learned to think objectively about water-safety, immediately detects the incident and decides whether it is a false alarm.

whether the person concerned is able to get himself out of trouble or whether it is a case where assistance is necessary. If assistance is required the rescuer has to make a further decision as to how it can best be given, remembering always that the easiest and simplest way is usually the best way and that this is often open to non-swimmers as well as swimmers. The speed and competence with which this decision is made will depend largely on experience, those without it needing more time to make their observations and deductions and to plan their actions with directness and logic. In no case will the rescuer rush blindly in without thinking, nor will he confuse foolhardiness with heroism. It may be that the rescue is beyond the capabilities of the would-be-rescuer, in which case he summons assistance and possibly directs operations. At a beach patrolled by members of a surf life-saving club he has only to give the alarm and trained men and their equipment will take over with maximum efficiency and speed. A loud cry of HELP, repeated if necessary, from other than the victim, has often been the first and most important step in saving a life.



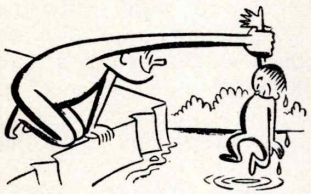
A drowning person, petrified with fear, may sink below the surface almost immediately on immersion as the result of throwing his arms above his head and expelling his breath in trying to call for help, but far more frequently he will remain at the surface for an appreciable time, partially supported by air in his clothes, by some floating object or by his trying to 'climb out of the water' in an instinctive struggle for survival. As long as he is able to get spasmodic breaths he is not coming to any great harm but the rescue must not be delayed one second longer than necessary as it is impossible to tell just when a drowning person will go under. Once under and deprived of oxygen, physiological changes commence immediately and result in death in just a few minutes.



There are innumerable ways of making a rescue but they can be summarised as REACH or THROW, WADE or ROW but only as a last resource SWIM and TOW.

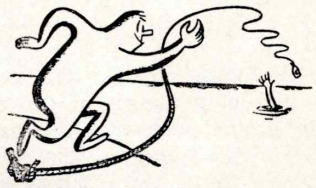
Reach:

Non-swimmers who fall off river-banks or out of boats are usually within reach long enough to be grasped and pulled to safety. A rescuer who lies on the bank can reach out almost three feet while the drowning person, ready to clutch at the proverbial straw, may reach out to the rescuer and add another two feet to the effective distance. In a swimming pool with a firm hand-hold a non-swimmer can stretch out his legs for the person in difficulty to grasp and 'climb' to safety, or, alternatively, he can hold on with one hand and reach out with the other. A reach rescue may also be made with a pole, paddle or oar, a branch of a tree, a walking stick or umbrella or anything at all that can be reached out to the victim. If he is unable to grasp it, it can be put under an armpit and used both to support and move him towards the bank.

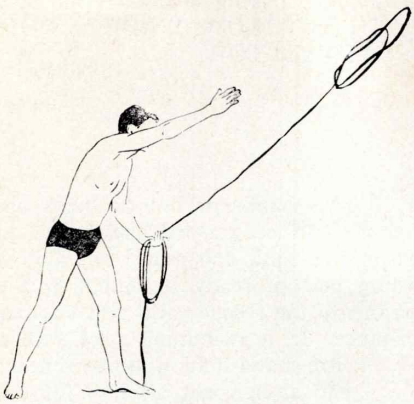


Throw:

A rope is a real life-line when it is thrown to a drowning person and used to pull him to safety. It should be loosely coiled and held half in one hand and half in the other or half in the throwing hand and half on the ground, in such a way that it uncoils itself as it is thrown. Care should be taken to see that one end is fastened or held securely.



Although there are several ways of throwing a line the easiest is with an underarm swing, releasing one's hold when the arm



is pointing over the victim's head. Unless waterlogged it will float well enough to be pulled within reach of the victim's hands, the rescuer moving to right or left along the bank if necessary. If the first attempt is not successful it can be quickly pulled in and recoiled for another attempt. An unweighted line can be thrown with reasonable accuracy for a distance of thirty feet but for greater distances a weight such as a shoe tied to the thrown end improves both direction and distance. In this case only a few coils should be held in the throwing hand and care should be taken to see that the victim is not hit with the weight.

Coiled life-lines should be kept readily available at deep-water swimming pools and bathing places and interested persons should be encouraged to become proficient at throwing them. A 'throw' rescue can also be made by throwing some buoyant object to the victim who, with this support, can then be encouraged to kick himself to safety. For a child a closed cake tin or inflated toy will do: for an older person a plank, a life-buoy, a car seat or spare tyre will serve the same purpose. Where a victim falls in to a dock whose sides preclude his being landed from a swimming rescue, a wise rescuer will first throw in something buoyant to support both himself and the victim while further help is being organised.

Wade:

Whenever possible it is better to wade rather than swim to a person in danger of drowning. A rescuer with his feet on the ground will reach the victim more quickly and more easily than one swimming and will be able to assist him to the shore with the confidence of knowing that there is no deep water on the way. In this manner an adult non-swimmer can assist a child who is in difficulties out of his

depth. A wading rescue can be combined with a reaching rescue if there is on hand a plank or pole that can be pushed out the last few yards into deep water. It can also be made stronger and safer if several people clasp each other's wrists and form a human chain, as would be desirable in a strong surf or a swiftly flowing river.

Row:

If a victim is beyond assistance from a reach, throw or wade, a wise rescuer, no matter how good a swimmer, will use a boat rather than swim to the rescue, provided that one is immediately available. Any water craft will serve the purpose, for even if he cannot manage it himself there is likely to be somebody present who can, leaving him free to concentrate on getting the victim aboard. Persons who get into difficulty some distance from the shore have most likely swum there or gone out in a boat or canoe. They can usually be relied upon to keep themselves afloat by treading water or holding on to their upturned craft until help arrives. A non-swimmer in this predicament and with no buoyancy aid available is not likely to remain at the surface for more than a minute and in this case a boat is invaluable as a base for search and rescue operations. A swimmer who has swum two or three hundred yards, perhaps with some of his clothes on, is not at his best for repeated surface dives, whereas the same swimmer, taken to the scene of the mishap by boat, will have had time to prepare himself for the necessary under water searching. His additional height above the surface will also make it easier for him to see tell-tale bubbles or a body under water. A further advantage is that when an apparently drowned victim has been brought to the surface the rescuer can carry out expired air resuscitation, first while holding on to the boat and then after the victim has been lifted aboard. By contrast, a swimming rescue over this distance would not only be an ordeal for an exhausted rescuer but also would mean that the victim could be without oxygen for a further five minutes and in consequence probably beyond human aid by the time the shore was reached.

When effecting a rescue by boat there has again to be a rapid evaluation of circumstances as the final approach is made. If both conditions and the victim are calm he can be offered a hand-hold and gently moved to the stern preparatory to being lifted aboard. If he is frantic and likely to capsize the rescue craft a 'reach' with an oar or a 'throw' with a line will be safer, as would be manoeuvring the boat so that contact was made over the stern. In a strong wind or heavy sea care must be taken not to injure the victim with boat or oar or to cause a capsize by unseamanlike practice or haste. If the victim has disappeared from the surface before the boat arrives at the scene the rescuer has no option but prepare for an under-water search. If accompanied, he can leave it to his crew to keep the boat in position and to help him and the victim aboard. If alone, he should ship the oars, make every effort to anchor the boat and leave a rope over the stern with which the victim's body can be secured while he himself is doing artificial respiration or climbing aboard. He will then jump or dive from the stern and commence an under-water search. When the victim's body has been recovered it should be brought to the stern and held there while artificial respiration is carried out for one or two minutes. An effort should then be made to get the victim aboard so that he can be taken ashore as soon as breathing is restored or help arrives. If it is impossible to get the victim aboard the rescuer should support him in such a position that artificial respiration can be commenced and continued until help arrives.

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Swim and Tow:

Only when there is no other way of giving assistance will the rescuer consider swimming out to the victim and towing him to the shore. Even then he will measure his ability and experience against the conditions prevailing. One accustomed only to short distances in a sheltered pool will not attempt a rescue in rough and turbulent conditions unless he feels fairly confident that he can succeed. Double fatalities are all too common. Before entering the water he will move quickly to the position which will give him the shortest swim and if dressed will decide what clothes to discard to ensure

that he reaches the victim in the shortest possible time. He will remember that he can both 'go' and 'tow' twice as quickly without clothes and will be able to face a possible release much more confidently if unimpeded.

Entry

His mode of entry will depend upon conditions. He will dive into a swimming pool or river where he has a firm take-off and assured depth free of obstructions. His dive will be shallow in order to take him as far from the bank as possible and so reduce the distance he has to swim. He will jump rather than dive from a high jetty or wharf, unless he is fully confident of his ability to dive therefrom, and into any water of uncertain depth. Off rocks he will clamber down and slide in, and from a beach or shelving bank he will wade as far as possible before commencing to swim.

He will swim to the victim with his fastest stroke for the particular conditions and distance but at the same time will keep something in reserve for the return journey with the victim. He will keep the victim under observation as much as possible and will pay particular attention to keeping on a straight course, using available landmarks where he cannot see the victim or relying on cross bearings from observers on shore. The greatest care must be taken during the last few yards of the approach to a drowning person, who, in a frenzy of desperation and with superhuman strength is likely to clutch fiercely and relentlessly at anything coming within reach. No matter how well trained in releases, the rescuer must take all possible steps to avoid being taken hold of in any way. At its best a drowning person's clutch makes a rescue more difficult: at its worst it can cause both rescuer and victim to lose their lives.

Avoiding Clutch

Final Approach

The breast-stroke is easily the best stroke for the final approach as it enables the rescuer to make a quick appraisal of the condition of the victim and to get his breath for the possibly dangerous contact. It also brings him face to face with the victim who may be calmed by the sight of his rescuer. In the last few seconds the rescuer has to decide whether to make a frontal, a rear, or an under-water approach, bearing in mind all the time that under no circumstances must he allow the victim to grab hold of him. If the victim is conscious he can continue his frontal approach, talking to him as he seeks an opportunity to turn him on to his back. If his voice is sufficiently command-

ing he may be successful in persuading the victim to take a good breath and turn himself on to his back. If a talking approach fails to bring co-operation and the rescuer is unwilling to move in close and attempt to turn the victim round he may be able to swim quickly to the rear and grasp him in towing position more or less by surprise. If the victim seems intent on grabbing hold of his rescuer or persists in turning to face him it may be possible to dive from the surface, either head or feet first, and then come up behind him and take hold as for a rear approach. Or the rescuer may consider a frontal underwater approach from a depth below the victim's feet, turning him quickly around with a grip just above the knees and then sliding up to a rescue position. This type of approach should not be attempted unless the water is clear enough to keep the victim under observation and then only by an experienced lifesaver; those less competent would be wise to stand off and await developments rather than take the risk of being drowned in a fruitless attempt to break away from the victim's grasp. But it is worth remembering that if the rescuer had available something buoyant such as a life-buoy which the victim could take hold of instead, it would be a simple matter to tow the life-buoy and attached victim to safety.

If the victim has disappeared by the time the rescuer arrives on the scene it becomes necessary to dive from the surface to effect a rescue. This may be done either head or feet first, the former needing an approach swim of several feet and the latter a stationary treading-water position. If swimming breast-stroke, the rescuer continues until he is two or three feet away from a point directly above where he thinks the victim is. Then, after taking a good breath, but without altering the rhythm of his stroke or losing way, he ducks his head and shoulders and lifts his hips at the same time as his arms pull wider round than usual. Still taking care to keep his head down, he raises his legs vertically above the surface and pushes his arms downward. The weight of his legs ABOVE the surface should force him down to a depth of 6 to 10 feet, depending on his natural buoyancy and his skill in keeping his legs vertical while the descent is being made. A considerably greater depth can be achieved if he dives and then swims downward as described on page 109.

Surface Dive

If swimming the crawl stroke the rescuer, again without losing speed or the rhythm of his stroke and as if commencing a somersault turn, will push the recovering arm downward

instead of forward and at the same time duck his head and shoulders and raise his legs vertically above the surface as described above. This dive also may be supplemented by swimming downward under water. A feet-first dive is safer when there are likely to be obstructions below the surface and the rescuer wishes to make a preliminary investigation with his feet. From a treading water position and with a good breath he submerges by first raising himself as high as possible in the water and then quickly raising his arms vertically above his head. In this case it is the weight of his arms ABOVE the surface that pushes him down. Once under the surface he can use his arms to gain greater depth or stay at the bottom while making a search with a walking motion of his legs. This arm movement is similar to that of treading water except that pressure is applied on the upward and not the downward phase.

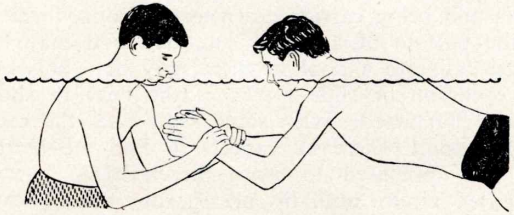
If the victim of a drowning accident has disappeared before the rescuer is able to pin-point the exact location, the underwater search that has to be made is more likely to result in the recovery of a body than the rescue of a person who can be revived by artificial respiration. Diving at random is likely to prove fruitless so the rescuer should make every effort to find clues and make his deductions before diving. The body may have sunk only two or three feet below the surface and be visible, even in murky water, to an observer in a boat or on a bank or bridge. There may be bubbles of air still rising from his clothes and being carried downstream from where the body lies on the bottom of a river. Another child may have seen a playmate fall into a pool or there may be a splashed patch, broken vegetation or slide marks in the mud to show where the accident happened. With some such clue, the rescuer will dive to the point where he expects to find the body and be prepared to swim therefrom in ever-widening circles until his breath runs out. With no clue, an underwater search to a grid pattern must be made. The search area will be divided into so many lines of search five to ten feet apart and a progressive search made, first at one level and then if necessary at another. Unless wearing rubber fiippers this underwater swimming is most exhausting and the rescuer should allow himself adequate recuperation between efforts. He should endeavour to enlist the aid of onlookers to mark the lines that have been traversed and to summon additional assistance. Wherever possible, he will dive from a bank to commence a sweep rather than commence

Under-water Search

with a surface dive and he will be more concerned with the thoroughness of his search than with the distance he can cover with each sweep. To bring to the surface a body found on the bottom, the rescuer will take a firm hold under the armpits from the rear, put his feet on the bottom and push upward sufficiently vigorously to reach the surface. In the event of the body being found under water but not at the bottom, or at the bottom where there is soft sand or weed, the rescuer will take hold and swim upward with the body as in a life-saving carry.

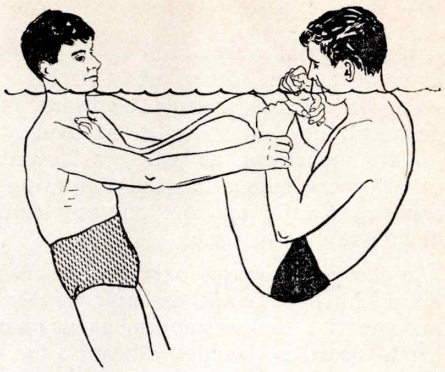
METHODS OF RELEASE

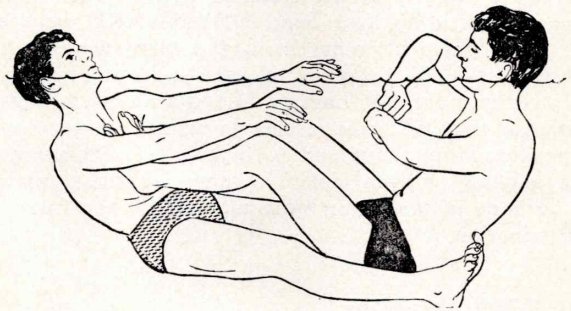
A prudent life-saver, no matter how capable, will do everything he can to avoid being clutched by a drowning person who is more likely to regard him as something to hold on to, or something to climb upon, than as someone come to remove him from his perilous situation. But if an error of judgement has been made, the rescuer must be prepared to release himself from a grasp which at its best will immobilise him and at its worst will render him as helpless as the victim. Although there are many ways in which victim may clutch rescuer, the basic



principles of releases can be learnt from the four methods outlined in this section and then adapted to suit any variation that may occur. Releases need a fair measure of skill and strength and extraordinary ability in controlling and holding the breath. For this reason, they are not required from young children in examinations for the Elementary Certificate. A rescuer must be prepared to act **immediately** upon contact. Shock tactics are called for and movements must be sudden, firm and continuous

right through until the victim is in a towing position. In some cases he can break contact by doing no more than suddenly submerging himself and so causing the victim to let go rather than be drawn deeper down under the water. In others he may be able to bend his knees upward and place his feet against the upper part of the vicitm's body so that he can use very strong muscle groups to force himself free. He should if possible avoid





any movement which forces the victim further under the water, as this could intensify the struggling and lessen the chance of post-rescue recovery. The efficiency of any release depends equally upon the accuracy and the speed with which it is carried out. Those outlined below should be learnt on land, practised slowly until the correct technique is mastered and then perfected to the stage where it is a case of grab—snap out of it—towing position all in one continuous movement carried out so quickly that an onlooker can scarcely follow the sequence of movements. Even when thoroughly mastered they should be practised frequently and realistically in the spirit of "It's your life or mine".

The Wrist Grip:

If the victim grasps both wrists or lower arms of the rescuer, as could happen with a breast-stroke approach, the rescuer will swing his arms vigorously downward, straightening them as they go, until they almost touch his body. Then, still in one continuous movement, he will turn his thumbs inward until palms of hands are facing outward and swing his arms sideways. The resulting painful pressure on the victim's thumbs should cause him to release his grip.

If the victim grasps only one of the rescuer's wrists or lower arms with both hands, as could happen with a crawl approach, a somewhat similar movement is made, assisted by the free hand. Speed is essential, otherwise the victim will climb up the arm and take a stranglehold around the neck. If the clutched wrist is at or above shoulder level the rescuer will push his free hand UPWARD between the victim's arms, grasp his other hand and then swing both arms vigorously DOWNWARD. (Wrist release No. 1.) If the clutched wrist is below shoulder level he will push his free hand DOWNWARD between the victim's arms, grasp his other hand and then swing both arms vigorously UPWARD. (Wrist release No. 2.) These releases from a wrist grip are easy ones to do and are especially valuable in practice as they teach the rescuer to maintain a good treading water position throughout and to make the break-away movement in a quick or even violent manner. A wrist grip release has to be done in the water by candidates for the Intermediate Star examination.

A Grip Around the Neck:

The basic principle of 'Get down out of it' is observed if the rescuer is clasped around the neck. If the grip is made with the victim's arms straight, or if it can be anticipated and intercepted at this stage, the rescuer has the choice of three methods, each of which must be done so quickly that the victim has no time to draw himself closer into a real stranglehold.

(1) He can place his hands under the elbows of the victim, push hard upward and at the same time submerge himself with his chin tucked well in. He then turns his victim around, without releasing his grip, by pulling inward and downward with one hand and pushing outward and upward with the other. (Neck Release No. 1.) Another way is to leave go at the end of the

push upward and when fully submerged take a fresh grip at the sides of the chest and make the turn.

(2) He can place the palm of one hand under the elbow of the victim's adjacent arm and his other hand behind the opposite shoulder. He then pushes the elbow upward and backward, submerging and tucking his head in at the same time, and follows through by pulling the victim around to a carry position with the hand behind the shoulder.

(3) He can place the palm of one hand under the elbow of one of the victim's arms as in (2) and bring his other hand across in front of his body to grasp the same arm just above the elbow, thumb under and fingers over. A vigorous push upward with the hand underneath the elbow clears the rescuer's head and starts the turn, after which both hands continue the throw around. The hand holding the upper arm should remain in place until the turn is completed and the other hand placed in position for support.

If the victim takes hold with his hands tightly around the rescuer's throat, the latter can free himself by grasping the victim's arms firmly at the elbows and then pressing violently upward and inward.

If the rescuer is clasped closely and tightly around the neck with the victim's head over one of his shoulders, he brings his hand on that side up and over the encircling arm and places it securely against the victim's cheek, with the little finger against the nose and the thumb hooked under the jaw. His other hand is brought up, seizing the victim's arm on that side just above the elbow with his thumb in and his fingers out. In one continuous movement the rescuer both frees himself and turns the victim, pressing away with the hand against the face and upward and around with the hand holding an arm. The rescuer must be prepared to slide DOWNWARD with his chin drawn in to his shoulder as he lifts the victim's arm UPWARD, preparatory to throwing it around over his own head. (Neck Release No. 2.)

If the rescuer is grasped tightly around the neck from behind, he must tuck his chin in and grip one of the victim's wrists with his opposite hand and the elbow of the same arm with his other hand. Holding tightly on to the wrist he then pushes the elbow up and over his head, which must be turned away to facilitate the movement. By continuing to push on the elbow and pull on the wrist, he turns both himself and the victim completely round, releasing his hold at the elbow as he brings

the arm against the victim's back with his wrist grip. This free hand is then put into position for a carry and the other one, still holding the wrist in the small of the victim's back, is used to flatten him out ready for a quick get-away. (Neck Release No. 3.)

A Grip Around the Body:

If the rescuer were within reach and treading water, he could be grasped around the body with his arms imprisoned. To release himself, he grasps the victim firmly with a hand on each side of the chest, preferably at the base of the ribs, tucks his chin well in to his shoulder and forces one elbow sideways and upward, and at the same time drops his opposite shoulder clear of the encircling arm. He completes the movement by pushing the victim upward, as he himself goes down, and then turns him to a carry position. (Body Release No. 1.)

A Grip Around the Body from behind:

No rescuer would knowingly let himself get into a position where he could be clutched around the body from behind. However, in a boating accident where several people are suddenly immersed, he may, while assisting one person, be taken unawares by another. If this happens, he must first protect his throat, by tucking his chin well in, since the drowning person's instinct compels him to 'climb' upward.

To free himself, he bends forward from the waist and then immediately straightens, forcing his elbows outward at the same time. If the first attempt is not successful, the bending forward and backward must be repeated until his arms are free and able to push the victim upward as he himself goes down. (Body Release No. 2.)

Alternatives to this method are:

(1) The rescuer grips the victim's thumbs and forces them apart by pressure against the joints. He then spreads his arms wide and submerges to get clear. This method is suitable only when the victim is holding loosely or when he is holding close to the rescuer's shoulders.

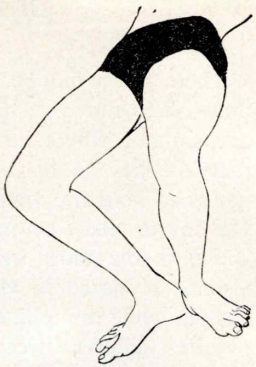
(2) The rescuer takes a deep breath, bends forward from the waist and starts a vigorous forward somersault. As the victim finds himself being carried downward head first he should release his hold. This method is suitable only when the victim is holding close to the rescuer's hips.

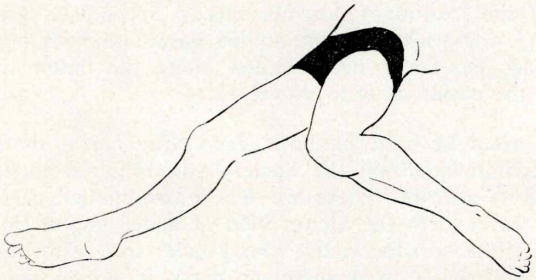
METHODS OF RESCUE

There are a number of ways in which a good swimmer can, unassisted, move a drowning person from the scene of an accident, or where he is in distress, to the shore. In most of them he lies on his back or side and uses either one or two hands to hold the victim, and his legs to provide motive power. He has to make a quick assessment of conditions and decide which is the most suitable for the particular case. He must also be prepared to change from one to another if conditions change while the rescue is being carried out. A struggling victim requires different treatment from a co-operative one, a light and buoyant child can be carried by an easier method than would have to be used for a heavy adult weighed down by clothes, and a rescuer who has already swum a long distance must choose the easiest possible method if he is to complete the return journey with the victim in tow. But whatever method is used the rescuer must get the victim into position without wasting a second, he must hold him firmly in place to give support and confidence, and yet at the same time move along at the maximum possible speed. Speed is a great help in towing, for with a victim on his back and with legs lower than head, the faster he is pulled along the flatter his body lies and the easier he is to move.

There are four basic methods, each with one or more variations, recommended by the Society and required in examinations for its awards. These are—(1) a two-handed carry, (2) a one-arm carry with the victim held at arms length, (3) a one-arm carry but with the victim's body held close in to that of the rescuer, and (4) a tired swimmer carry in which the rescuer swims breast-stroke and pushes the exhausted swimmer along in front of him. When learning these carries, it is better to practise and perfect the 'holds' on land before attempting to do them in the water. No attempt should be made to do 2 or 3 in the water until the would-be life-saver is able to swim quickly and easily on his back or side with one arm motionless, or 1 until he is able to swim on his back with both arms motionless, preferably folded on his chest. The Life Saving or Towing Kick may be either the Breaststroke Kick (see page 19), or the Scissor or Inverted Scissor Kick (see page 90).

When using the backstroke kick it is most important to bend the lower legs downward as the knees move apart in the recovery phase and not raise the knees so that the hips sink. At the end of this recovery movement the feet must be turned outward by rotating the thighs at the hip joints just BEFORE the outwards, backward and together thrust is made. The extra power needed for life-saving comes as a result of a better 'grip' of the water through frequent practice and by increasing the frequency of the kick. With a heavy victim the kick becomes a short, continuous, circular movement, with practically no pause between strokes, to propel both rescuer and victim rapidly through the water. If on one side, more likely on the side on which side-stroke is swum, the scissor or inverted scissor kick is used. Here again plenty of practice is needed to develop a strong, powerful kick, one able to be speeded up or slowed down to meet the varying demands of a rescue.





Two-Handed Head Carry:

This method gives the victim a feeling of security as his head is held with both hands on the rescuer's chest, the rescuer swimming on his back with either breast-stroke or side-stroke kick. The rescuer's palms are over the victim's ears with fingers pointing upward, his elbows low down and tucked in, and his lower arms against the sides of his body. Useful alternative holds are of the victim's upper arms midway between elbow and shoulder, and under the armpits with fingers against the front of the chest.

Hair, Clothing or Chin Carry:

In this method the rescuer has a firm grip of hair, clothing or chin with one hand and he swims on his back or side with his free arm and both legs. If on his back, his free arm moves in time with his legs, bending at the elbow as his legs bend, moving outward and straightening as his legs move outward and then pressing vigorously against the side of his body as his legs close together. If on one side, the rescuer uses both legs and his lower arm as in side-stroke (see page 20), holding the victim with a straight upper arm. This one-arm carry is an easy one to do and can be maintained at a good speed for a long distance. If the victim struggles, the rescuer's free arm can be used, first to subdue him, and then to hold him more securely. If he grasps the wrist of the rescuer's holding arm, he can keep this grip and gain confidence therefrom without affecting the efficiency of the method.

In the hair carry, the rescuer slides his fingers through the hair from the back of the victim's head and takes a firm grip of a handful of hair. In the clothing carry, he takes a firm grip of the clothing at the back of the victim's neck, taking care not to restrict his breathing in any way. In the chin carry, the rescuer's hand is cupped around the victim's chin, with the thumb just below the lower lip. In each of these rescues the rescuer's holding arm must be kept straight and in line with his body.

Hip Carry:

Although this also is a one arm carry the victim is given a greater feeling of security because he has the rescuer's arm across his chest and rescuer's hip supporting his body. But it is more difficult to do and progress through the water is slower. From behind the rescuer passes one arm over the victim's corresponding shoulder and grips with his hand the opposite armpit. He clamps his elbow firmly on to the victim's chest and holds him securely against his own body, if possible with his hip in the small of the victim's back. The rescuer's body will be directly beneath that of the victim where it can provide some measure of support and stop the victim's legs sinking to the point where they retard progress. When the rescuer is swimming side stroke he will be wholly on his side; when swimming with breast-stroke kick his position will be midway between that of back-stroke and side stroke.

Tired Swimmer Carry:

This method is the easiest of all but can be done only with the co-operation of the victim of cramp or a swimmer exhausted but not completely helpless. If a swimmer is so stricken or becomes indisposed some distance from the shore his companion can easily 'push him to safety' with maximum speed and minimum effort. In such a situation the rescuer swims up to a face-to-face position and says, "Put your hands on my shoulders, keep your arms straight and lie back in the water." He then swims breast-stroke, or breast-stroke with a scissor kick, pushing the disabled swimmer along in front of him, keeping him under observation and giving verbal reassurance from time to time.

RESUSCITATION IN THE WATER

A victim of drowning who has been underwater and unable to breathe for no more than two or three minutes, is in immediate danger of mortal brain damage through lack of oxygen, so a rescuer must be prepared to carry out expired air resuscitation as soon as possible after he has brought him to the surface. A strong and proficient life-saver will commence resuscitation in deep water (see page 63) but one less proficient will have to wait until he is able to hold on to something or is in waist-deep water. Here he will hold his victim securely and give 'ten quick breaths', repeating them at approximately one minute intervals until he has him on firm ground.

REMOVAL OF A HELPLESS PERSON FROM THE WATER

It often happens that an apparently drowned person is brought to a river bank, or dock wall, or to shallow water where the rescuer is faced with considerable difficulty in transferring him to a place of safety where resuscitation treatment can be given—or continued, if the rescuer has commenced this as soon as he had a hand-hold or foot-hold.

On a gently sloping bank or beach the rescuer will change from a deep-water to a shallow water carry as soon as possible. Walking backward himself and holding the victim under the armpits, he will float him as close as possible to the water's

edge and then drag him gently up bank or beach until it is safe to stop. At a swimming pool helpers are usually present on the poolside but at a river, dam, wharf or rocky foreshore the rescuer frequently has to complete his task unassisted. Once again a rapid evaluation of the situation is called for in order that the quickest, safest and easiest method may be used. In some cases, it may be better to tow the victim to the shallow end of a pool, to steps at a wharf or to a more accessible part of a river bank or foreshore. In others, it may be necessary to lift him out of deep water and then drag him around rocks and other obstructions to a place of safety.

To lift his victim at a low vertical wall or bank, the rescuer, taking care to keep the victim's face above the surface all the time, grasps one of the victim's hands and places it on the wall, securing it with his free hand, while he places the victim's other hand on top of the first. With one hand holding the victim's two hands down and his other on the wall he 'breasts' himself out of the water, turns around and adjusts his hold so that right hand is holding left wrist and left hand right wrist. He then pulls the victim's body up over the edge until head, chest and thighs are lying on the ground, swings the legs over the edge and then rolls or drags him to a safe place. Great care must be taken in lifting to avoid strain to the rescuer and injury to the victim. The rescuer should lift by straightening bent legs rather than his back and he should take care not to learn backward as he lifts because of the risk of slipping into the water.

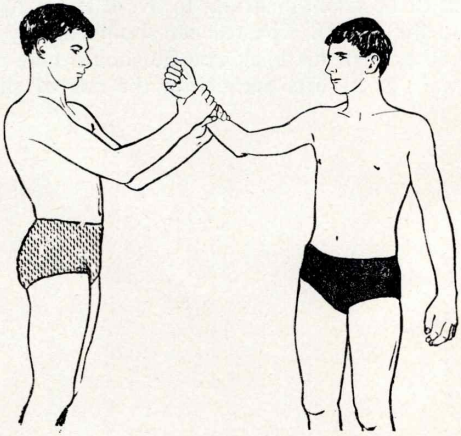
RELEASES

The methods of release taught by the Society form the basis for prompt action by a well trained rescuer, and allow for variations depending on the circumstances. The following methods can be easily learnt but should be practised firstly on land and then in the water so that they become automatic when a rescuer is gripped.

GRASP OF WRISTS

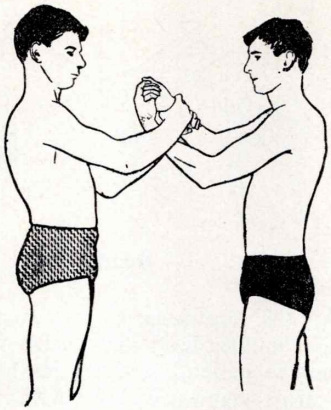
Wrist Release No. 1:

The patient grasps one of the rescuer's wrists or lower arms with both hands, as could happen with a crawl approach.



Ready

With the clutched wrist at or above shoulder level, the rescuer will push his free arm UPWARD between the patient's arms, grasp his own hand and then swing both arms vigorously DOWNWARD. This should be done quickly.



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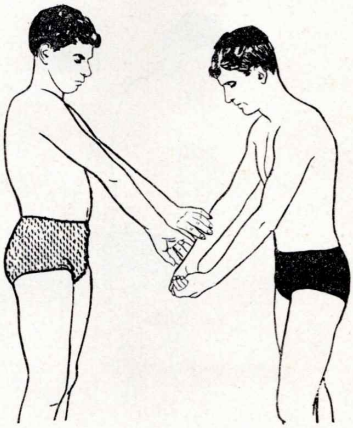

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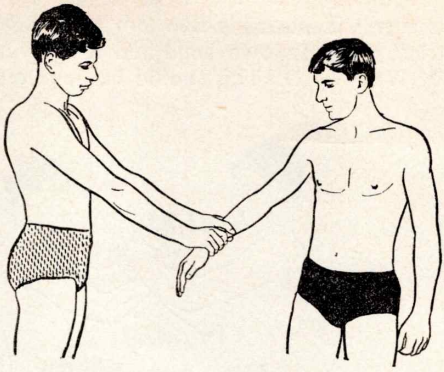
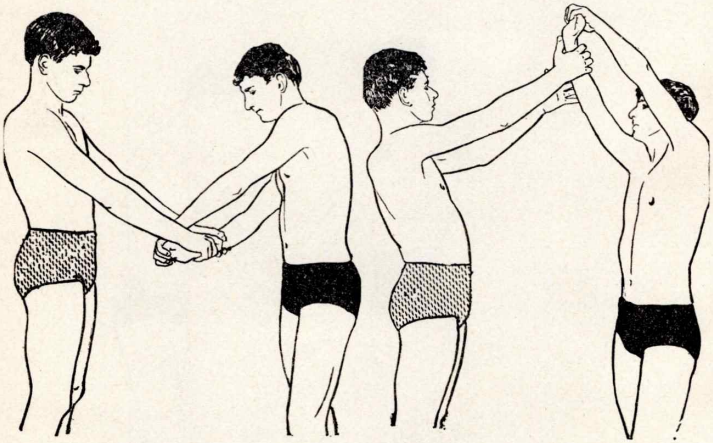
Wrist Release No. 2:

The patient grasps with both hands below water level, one of the rescuer's wrists or lower arms.



Ready

The rescuer halts the downward movement of the clutched arm below his shoulder level and pushes his free arm DOWNWARD between the patient's arms, grips his own hand and then swings both arms vigorously UPWARD.

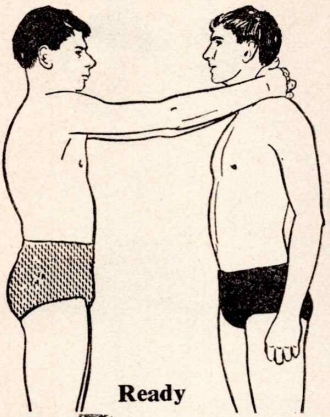


One **Two**

GRASP OF NECK

There are several ways in which a grasp of the neck can be broken, and the rescuer must evalue the situation without delay and decide the release to use.

Neck Release No. 1: The patient clasps his hands around the rescuer's neck with his arms extended. With a continuous upward movement as he takes a breath, the rescuer grips the patient by the elbows, (thumbs in, fingers out), pushes them upward, and submerges a little, with his chin tucked well in.



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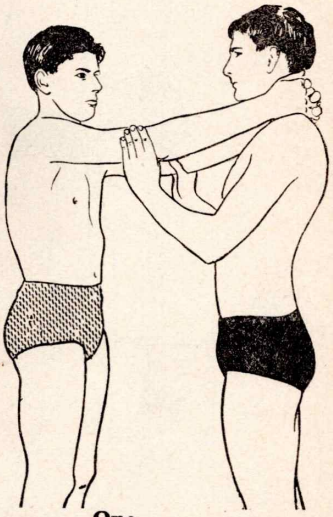

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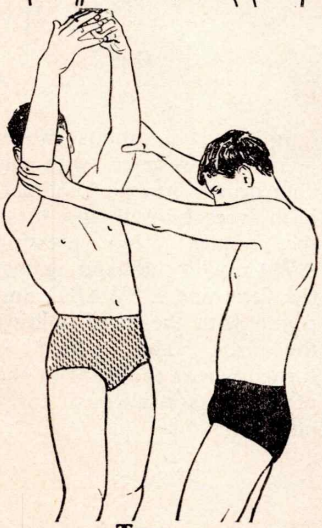

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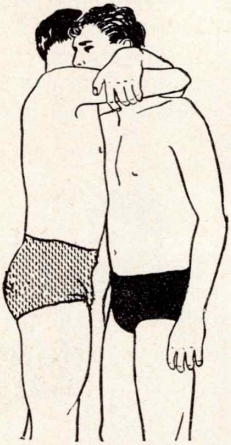
As the movement continues, the patient's arms are moved so that he is turned round across the front of the rescuer to a convenient carry position.

An alternative is for the rescuer to use both hands on one of the patient's elbows.

Neck Release No. 2: The patient hugs the rescuer tightly and closely around the neck. The patient's head will be over one of the rescuer's shoulders. The rescuer brings his hand on that side up and over the encircling arm and places it securely against the patient's cheek, preferably with the thumb hooked under the jaw. His other hand is brought up seizing the patient's arm on that side just above the elbow (with his thumb in and his fingers out).



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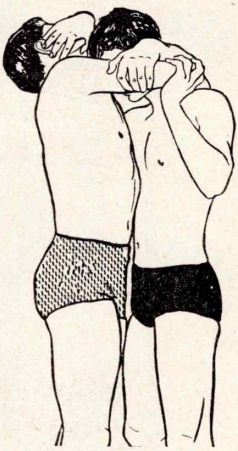

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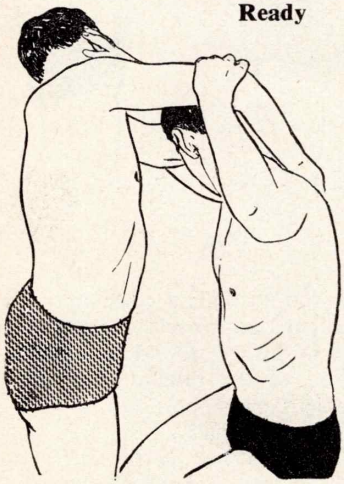

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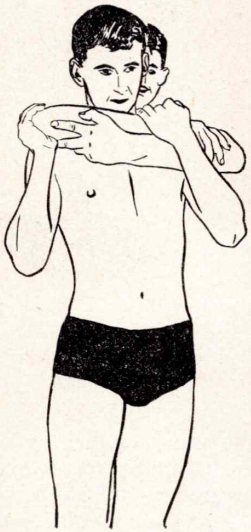
In one continuous movement, the rescuer, with his chin drawn into his shoulder, both frees himself and turns the patient by pressing AWAY with the hand against the face, and UPWARD and round with the hand holding the arm. The patient is turned across the front of the rescuer to a convenient carry position.

Neck Release No. 3: With his arms folded around the rescuer's neck, the patient holds him firmly from behind. Immediately the clutch is felt, the rescuer tucks his chin on to his chest, takes a deep breath, grips one of the patient's wrists with his opposite hand and the elbow of the same arm with his other hand. The rescuer then turns his head away from the gripped elbow, and the patient's wrist is held firmly while the elbow is forced up and over the rescuer's head. The rescuer may submerge with this action.



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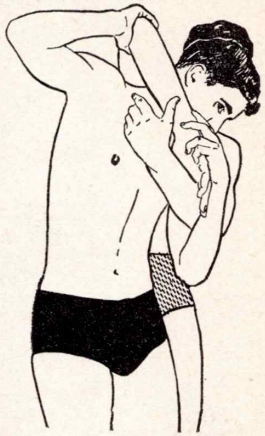

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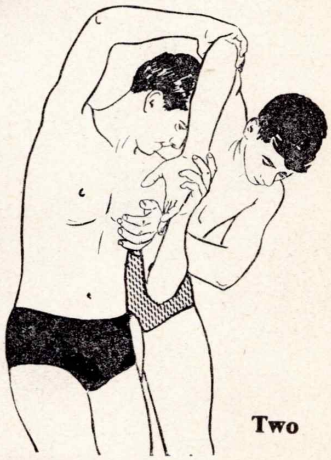
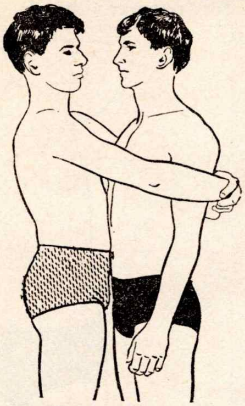
While still pulling on the wrist and pushing on the elbow, the rescuer should turn the patient completely round and bring the patient's wrist to the small of the patient's back. This will give the rescuer control and enable him to assume the carry position.



Two

GRASP OF BODY

Body Release No. 1: The patient holds the rescuer firmly with his arms around the rescuer's body, enclosing the upper arms. To release the grip, the rescuer grasps the patient firmly with a hand on each side of the body, (thumbs to the front, fingers to the side), anywhere from the armpits to the waist. The base of the ribs is the most effective position.



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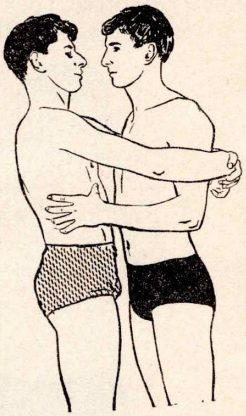

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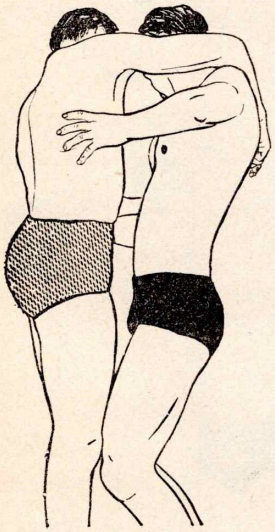
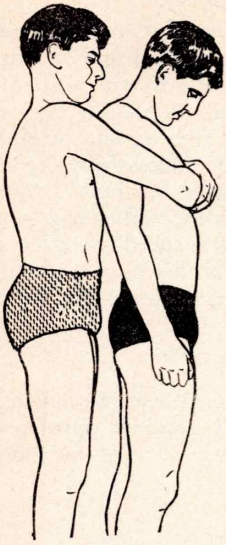


Two

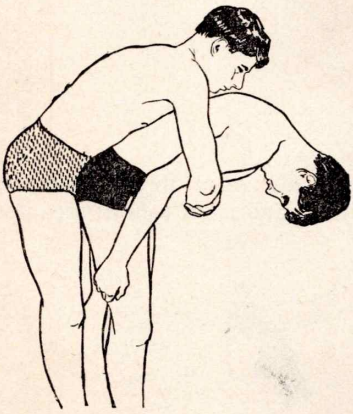
In the same action, the rescuer turns his head to either side, tucks his chin into his shoulder, forces one elbow sideways and upwards whilst quickly dropping the opposite shoulder clear of encircling arm and then pushes the patient upwards. This forces the rescuer below the surface, but he should endeavour to give sufficient support to keep the patient's head above water. As the rescuer slides free from the patient's hold, and while still supporting him, he turns the patient round, transferring his hands to a carry hold.

Body Release No. 2: Grasping his own hands in front of the rescuer, the patient holds him firmly around the body from behind, enclosing his upper arms.



Ready

As soon as the clutch is felt, the rescuer tucks his chin on to his chest, takes a deep breath, bends forward from the waist, immediately and vigorously straightens, and as he does so, forces his elbows outwards. He thus frees himself from the patient's clutch, pushing the patient's arms over his head as he sinks down in the water. If the first attempt is not successful, the bending forward and backward must be repeated until the rescuer can free his elbows.



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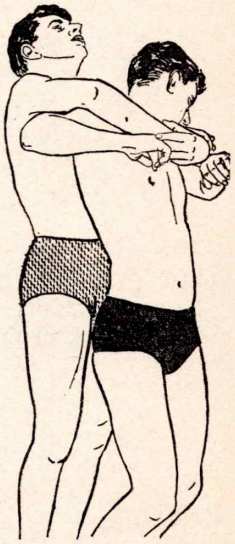

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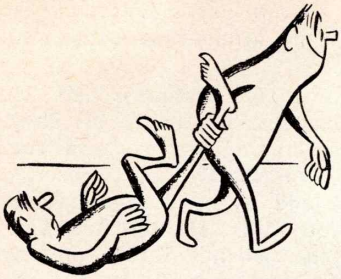
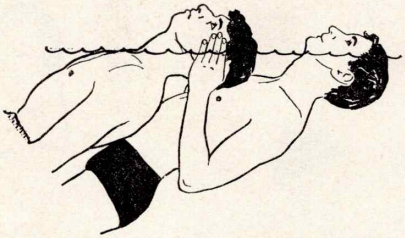


RESCUES

There are four basic rescue methods, each with one or more variations, all of which should be mastered so that a rescuer can choose the easiest possible method to successfully reach shore. These methods, when correctly used, give the victim the confidence of being supported firmly, face above water, and carried speedily. Speed is a great help in towing, for, with a victim on his back and with feet lower than head, the faster he is pulled along, the flatter his body lies and the easier he is moved.

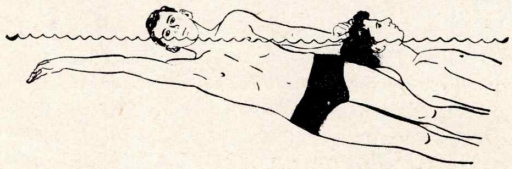
TWO HANDED HEAD CARRY

Carry No. 1: The rescuer's palms are placed over the patient's ears with fingers pointing upward, his elbows low down and tucked in, and his lower arms against the sides of his body (page 90).

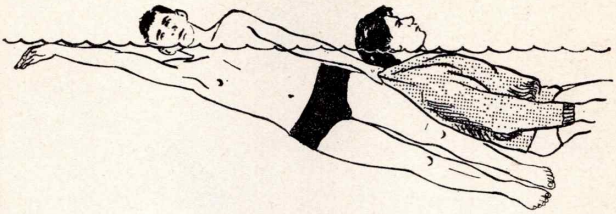


HAIR, CLOTHING, OR CHIN CARRY

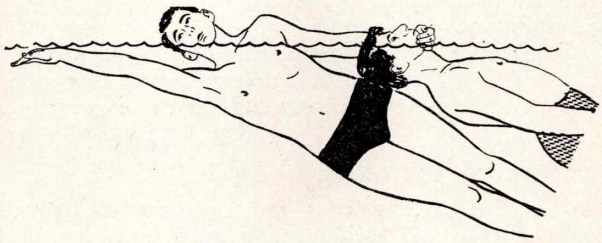
Carry No. 2: The rescuer slides his fingers through the hair from the back of the patient's head and takes a firm grip of a handful of hair.



Clothing Carry: A firm grip is taken of the clothing at the back of the patient's neck, taking care not to restrict his breathing.



Chin Carry: The rescuer's hand is cupped around the patient's chin with the thumb just below the lower lip.

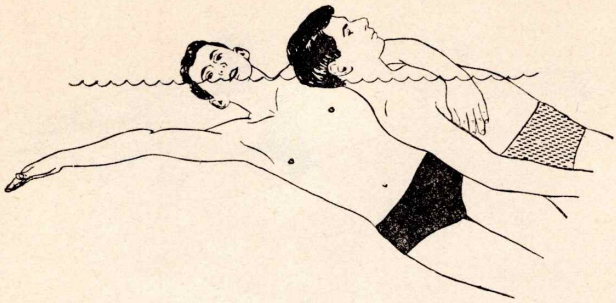


In each of these, the rescuer should keep his holding arm straight, and swims on back or side with his free arm and both legs.

HIP CARRY

Carry No. 3: From behind, the rescuer passes one arm over the patient's corresponding shoulder and grips with his hand the opposite armpit. He clamps his elbow firmly on to the patient's chest and holds the patient securely against his own body, rescuer's hip in the small of the patient's back. When the rescuer is swimming side stroke he will be wholly on

his side, if swimming with breast stroke towing kick his position will be midway between that of back-stroke and side-stroke, in both cases his free arm will be used to assist his progress through the water.

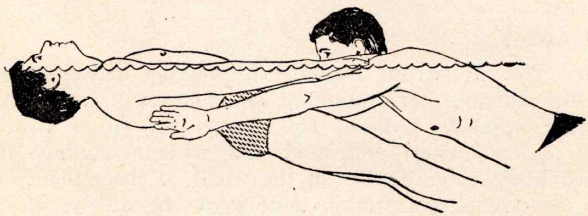


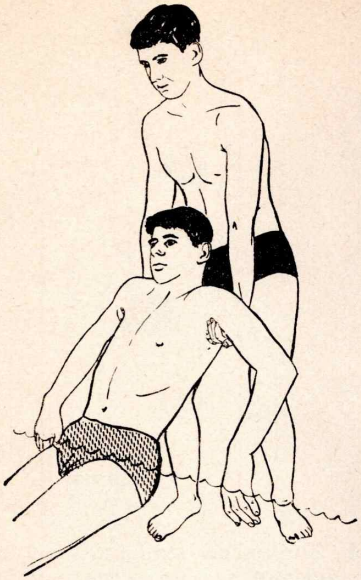
For Distinction Award candidates and strong swimmers, Expired Air Resuscitation can be applied when using this carry, which should be modified as follows.

The rescuer moves his hand from the patient's armpit to the back of the patient's head, simultaneously passing his free arm under the patient's corresponding armpit and then grips the patient's chin. Expired Air Resuscitation can now be applied (page 63).

TIRED SWIMMER CARRY

Carry No. 4: The rescuer positions himself immediately in front of the tired swimmer, instructs him to place his hands on the rescuer's shoulders close to the neck with the arms straight, and to lean well back in the water. The patient keeps his feet apart to enable the rescuer to swim breast stroke, pushing the patient before him to the nearest point of safety.





LANDING PATIENT—

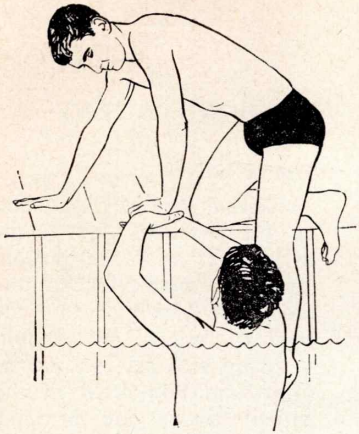
DRAGGING

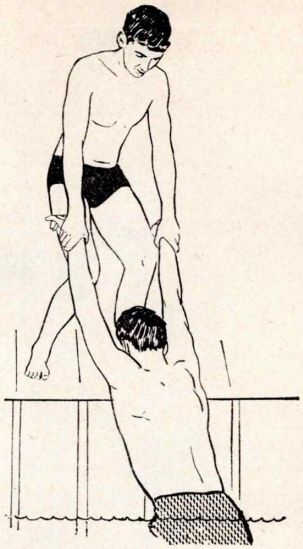
Method No. 1: As soon as the rescuer's feet come in contact with the bottom and he is unable to continue the tow owing to the shallow water, he should stand up with his back to the shore and take hold of the patient under the armpits, walk backwards, and drag him to shore. This is far less laborious than carrying the patient.

LIFTING

Method No. 2: The rescuer maintains a firm grip of the patient and turns himself and the patient to face the bank. The patient's arms are then lifted one at a time, and placed over the bank, one hand on top of the other.

The rescuer places his nearest hand on top of those of the patient and clambers on to the bank. Turning to face the water, the rescuer grasps the patient's left wrist with his right hand and the right wrist with his left hand, adopting an upright

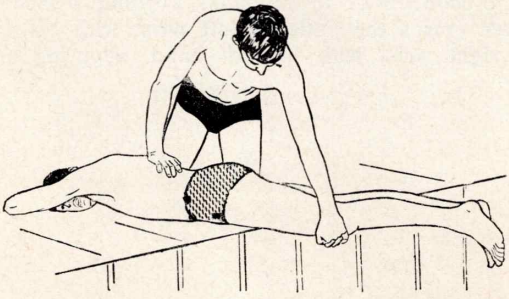




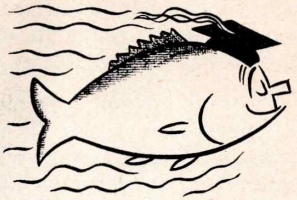
position with the knees flexed. The rescuer straightens his legs thus lifting the patient's body up and over the edge until the chest and thighs rest on the ground. Care should be taken to prevent the patient's body being dragged against the side or over the edge.

The rescuer then places one hand firmly on the back of the patient holding the body from slipping into the water, and uses his other hand to swing the legs upwards and inwards on to the bank.

At all times during the landing the rescuer must make every effort to keep the patient's face out of the water.



ADVANCED SWIMMING SKILLS



In examinations for awards up to and including the Bronze Medallion, the three fundamentals of life saving, release, rescue and resuscitation, are concentrated upon. However to make the higher awards more interesting and to improve the all-round ability of candidates, the examinations for the Bronze Cross, Award of Merit, and the Distinction Award, require that candidates demonstrate three progressively more difficult advanced swimming skills, and for the Diploma, six of the most difficult ones.

Learning these swimming skills extends the swimmer's knowledge of breath control, buoyancy and balance, and of rhythm and relaxation in the water. They teach him to think objectively about the mechanics of propulsion, and, by making him more versatile in the water, improve his ability as a life saver.

Each skill must be started and finished in the correct position, carried out with accuracy and precision, and be free from unnecessary movement and splash.

DIVING

As it may be necessary for a life-saver to enter the water from a height to carry out a rescue, candidates in examinations for the Award of Merit, Distinction Award and Diploma have to show proficiency in both a head first and a feet first entry from a height of 8 to 10 feet. When there is an assured depth of water and a stable foothold, a dive is better than a jump, as it takes the rescuer several yards on his way and saves precious seconds. When the foothold is unreliable, as off a boat, when the depth of water is not known, when underwater obstructions are likely, or when the victim is so close that a dive would take the rescuer too far out, a jump is better.

The dive required in the above examinations is a plain header, forward, and it may be done from either a fixed platform or a

springboard. It must be done confidently, easily, and with the body completely under control all the time. A fall or flop should fail the candidate, as should any unnecessary hesitation on the board or platform before take-off.

Prior to take-off, the diver should ensure that there are no swimmers below and then take up an upright position with arms by sides. On take-off, his straight arms, with or without preliminary movements, lift or reach forward and upward at the same time as his legs, after a slight bend at the knees, straighten out and his feet press forcibly downward on board or platform. As the peak of the dive is reached, the body rotates forward until the heels are slightly higher than the head. If there is too much rotation at this stage, the body flops over on to the backs of the legs: if too little, then flat on to the front of the legs. This rotation is continued as the body falls from peak to entry, outstretched and straight from fingertips to toetips. Both this position and the line of flight prior to entry, should be maintained at least until the feet are well submerged, so that every part of the diver's body passes through the small opening made by his shoulders in the surface of the water. This means that the rotation must be restricted when diving into a pool only 7 or 8 feet deep or when diving well out to reach quickly a person in distress.

The jump required in examinations is a forward jump, straight, with a standing take-off. Like the dive, it may be done from either a fixed platform or a springboard. For a pass, a candidate must show the same confidence and control as is required for the dive.

The diver should stand on the end of the board, head erect and arms by sides or placed on front of thighs. He merely takes a good step forward with one foot, bringing the other forward quickly to a feet together position. Toes are pointed. The chin is tucked in but the shoulders are kept back to avoid a forward tilt of the whole body.

Just before take-off, a good breath should be taken through the mouth. If this breath is held tightly, with the tongue pressed firmly up against the top of the mouth, during the flight and the descent beneath the surface, there is little chance of water entering the sinuses through the nostrils and causing acute discomfort. This breath should be expelled through the nose as the diver surfaces.

THE SURFACE DIVE

A surface dive (page 82) is a dive from the surface of the water to commence an under-water search, to make an under-water approach to a struggling victim, or to recover an object or a body from the bottom.

In an award examination, when the required depth of water is available, a candidate has to make an approach swim, dive, recover an object and carry it on his chest to the nearest landing point. Before leaving the side of the pool, he should try to get cross bearings on the object to be retrieved, in case he is unable to see it from water level and has to dive and make an underwater search. He may use any stroke for his approach swim, but must make a head-first dive. If he swims crawl and 'dives' his head, shoulders and leading arm down BEFORE raising his legs, or does this type of dive from a breast-stroke approach, he must remember that the efficiency of the dive is directly proportional to the speed with which it is done. In any dive, the impetus from the approach swim, assisted by the downward thrust from legs straight and vertical above the surface should carry the diver to a depth of 6 to 10 feet before swimming strokes are needed for greater depth or an under-water search. Timing, too, is important. A good pull of an arm in crawl or arms in breast stroke as the head and trunk are bent downwards, followed immediately by an upward flick of the straight legs, toes pointed, ensures that the weight of the legs held vertically in the air will complete the drive to the depth required.

In an examination in a shallow pool where the required depth of water is not available, a candidate has to dive from the surface and swim underwater to the object to be retrieved. He will start his dive in the usual way, but will raise his head and flatten out just before reaching the bottom, possibly before his legs have reached the desired position vertically above the surface.

On reaching the object, the diver must grasp it with both hands draw his knees towards his chin so that he can place his feet firmly on the bottom, and push himself directly upward. On reaching the surface, he will swim on his back, with the object held on his chest with both hands, to the nearest landing point and place it on the side of the pool.

The object used for surface-diving practice should be of reasonable size and weight and so covered that it will not cause injury if an error of judgement is made when throwing it into a crowded pool. A brick, well wrapped and securely tied in a towel, makes a suitable object.

UNDRESSING IN THE WATER

As a practical life saving test in examinations, undressing may be done in a horizontal floating position, but preferably in a vertical one, assisted by movements of arms and legs as in treading water. It must be done inside a circle not exceeding 8 feet in diameter and within the time specified. Garments must be of everyday character and properly fastened. They should be removed quickly and smoothly, and without any unnecessary movement or splash (page 29).

TWIN TAIL

The starting position for this skill is motionless on the back with the arms lying loosely at the sides. Propulsion is from the crawl stroke leg kick (page 22), with no assistance from the arms. After covering about four yards on the back, the body is rolled on to one side for a similar distance, then on to the front, on to the other side, and finally on to the back again, a total distance of 16 to 20 yards. The movement of each leg should be similar to that of a fish's tail, knees and toes barely breaking the surface when on the back and the heels likewise when on the front. The whole exercise should be continuous and relaxed and the distance covered at a reasonable speed.

SCULLING

Sculling is done floating horizontally on the back with the arms at the sides and the feet extended along the surface in line with the legs. Propulsion is from a continuous circular motion of the hands, at the rate of about two a second, with the arms straight and the elbows close to the sides. To move head first, the hands are flipped gently outwards from the sides and then pressed vigorously back again. They move outwards with palms downward and wrists loose and relaxed, are then turned to commence the propulsion phase with a press downward and inward, and are finally extended in such a way that they push as much water as possible towards the feet.

To move feet first, the movement of the hands is reversed. They drive downward, outwards and backward, pushing water towards the head, and then recover with a relaxed flip inward. In examinations, a distance of 30 feet has to be covered, either head first or feet first.

MOTIONLESS FLOATING

Although motionless floating is an option in only the Distinction Award and Diploma examinations, it is extremely important as the basis of a number of other skills. Horizontal floating is a pre-requisite for movements like Rolling Log and Propellor, vertical floating for Spinning Top and both horizontal and vertical for Pendulum.

In horizontal floating, the body is on the back with the legs and arms straight and together, hands, palms uppermost, and at least the face, the front of the chest and the toes above the surface. Most girls and women float easily in this position, but boys and men, being less buoyant, usually have balance and breathing problems before they can keep their toes up.

As explained on page 26, the ease with which a body floats depends upon its volume to weight ratio. Air in the upper part of the lungs will keep the face above water but will not keep the legs at the surface. This can be achieved however, by getting the air deep down in the lungs by contracting the diaphragm, instead of into the upper chest by raising the ribs. This has the effect of increasing the volume of both the lower chest and the abdominal cavity without increasing weight, and so causing the legs to float to the surface. This type of breathing must be maintained as long as it is desired to keep the legs up, the breaths being frequent and shallow and as if trying to breathe more air in than goes out. As well as abdominal breathing, it will be a help if the muscles along the back of the spine, no longer needed to counterbalance the weight of a body now supported by water, are relaxed. This helps to keep the hips down and the feet up, whereas a hollow-backed position does the opposite.

A person who floats easily in a horizontal position is lucky, but he does not gain the knowledge that rewards a poor floater, who, with practice and patience, masters this skill. This one finds that his legs sink if his chest is expanded upward, because his centre of buoyancy is in his chest and his centre of gravity

in his abdomen. He learns to float horizontally by moving one centre towards the other, until they are in line vertically, by controlling his trunk muscles, by taking breaths in short gasps and holding it in between breaths, and by such devices as tucking his chin in and raising his hands slightly above the water, all of which alter the volume to weight ratio of the upper part of his body.

In vertical floating, the body is held in a standing position with arms by sides and head tilted slightly back. All except very buoyant people find it easier to do than horizontal floating. Just enough air is taken high up into the lungs to keep the face above water, and the trunk and back muscles are used to keep the back hollowed and the legs pulled downward and backward. When in this position, the body's centre of buoyancy is as near the head, and its centre of gravity as near the feet, as possible.

In examinations, candidates may float either horizontally for 30 seconds or vertically for 60 seconds.

SOMERSAULTS

All somersaults must start and finish in a horizontal floating position with the arms at the sides. To somersault with the body straight, it is necessary to 'dive' into the somersault as into a tumble turn or a surface dive. In the tuck position, a movement of the head starts the somersault, after which a rotation of bent arms, below the surface and in line with the shoulders, keeps it turning. In neither case may the legs be used to assist.

A forward somersault, straight, is started in a face-down floating position. A vigorous arm stroke is used to start the 'dive', after which a series of short paddling or sculling movements of the hands keep the body moving around the circumference of a circle with a diameter a little greater than the swimmer's height. The chin should be tucked in towards the chest, the body bent slightly at the waist, the legs kept straight and the toes pointed.

A backward somersault, straight, is started in a back floating position. As the head and shoulders are pressed backward and downward into a 'dive', the arms are bent at the elbows until the backs of the hands almost touch the shouders. A vigorous drive back to the sides with the hands and lower arms overcomes initial resistance, after which a series of smaller but similar

movements keep the body moving around the circumference of a circle as above. The head should be kept back, the back hollowed, the knees bent slightly and the toes pointed. When doing consecutive somersaults, a quick breath may be taken as the face comes above water.

A forward somersault in the tuck position is started also in a face-down floating position. The knees are drawn up under the body close to the chest and the arms are moved outwards from the shoulders. The head is then ducked down, with the chin drawn well in, at the same time as the bent arms make a vigorous sweep downward, backward and upward. A second consecutive somersault is easier than the first if the body is kept well tucked up and there is no pause between the two.

To go backward, the knees are first drawn up close to the chest and the arms moved outward and downward from the shoulders. Then, keeping tightly tucked up, the feet are tipped over the head, the head and shoulders are pressed backward, and the bent arms driven forward and upward, all in one continuous movement. Somersaults in the tuck position must be done as close to the surface as possible.

In examinations, two consecutive somersaults have to be done, forward or backward, straight or in the tuck position.

SPINNING TOP

This skill starts and finishes in a vertical floating position with the arms folded at shoulder level just below the surface. The body is spun around in this position, first six times one way and then six times the other, by short, quick movements of the legs. This leg action is similar to the crawl stroke leg kick (page 22), except that the knees bend more, as in cycling, and are slightly off centre, so that the water is pushed in the opposite direction from which the body is turning, by the soles of the feet and the backs of the legs. Once the body starts turning, it should rise until the folded arms are on, instead of below, the surface.

WATER WHEEL

Water Wheel is done with the body floating horizontally on one side, and the hands clasped behind the neck. With the shoulders and arms as the hub of the wheel in the centre and

the feet at the circumference, the body moves around a circle with a slow cycling action of the legs.

The pull of this leg movement should be accentuated so that about eight pedalling strokes will complete each of the two circles which must be done.

PLUNGE

A plunge is a shallow, standing dive, made head first from a firm take-off, which must be free from spring and not more than 18 inches above the surface of the water. Throughout the plunge, the body must be face down and the arms and legs motionless. The plunge is terminated by the raising of the head or by any movement of arms or legs. The distance is measured from the point of take-off to that of the finger-tips when the plunge finishes.

The take-off of a plunge is similar to that of a racing dive. The starting position is with the toes gripping the edge of the pool, the knees bent, the body inclined forward and the arms swung back behind the shoulders. Then, as the arms are flung forward, the legs give a vigorous push or spring off. By the time the body reaches the water, arms, legs, head and body should all be in line, with the thumbs touching, the palms downward and the feet pointing back. This position must be maintained during the drift forward, with muscles as relaxed as possible and the back slightly hollowed.

As the distance covered in a plunge will depend largely on how long the breath lasts, the lungs should be thoroughly ventilated prior to the take-off. A succession of quick, deep breaths will ensure that both the air in the lungs and the blood in the pulmonary network are carrying as much oxygen and as little carbon dioxide, as possible.

In examinations for the Award of Merit, candidates must plunge at least 38 feet for a pass. For this distance 5 marks are given. For each complete 2 feet beyond 38 feet, an additional mark is given, with a maximum of 10 marks for 48 feet.

In examinations for the Distinction Award, candidates must plunge at least 41 feet for a pass. For this distance 5 marks are given. For each complete 2 feet beyond 41 feet, an additional mark is given, with a maximum of 10 marks for 51 feet.

MARCHING

Marching in the water is done with the body in a horizontal floating position on the back, with the hands either on the hips or clasped behind the neck. Propulsion in a feet-first direction comes from a slow, alternating movement of the lower legs only, the thighs remaining level and the knees just below the surface. On the downward and backward propelling stroke, the swimmer endeavours to take hold of the water with the sole of his foot and the back of his lower leg and then briskly push this water under his body towards his head. In recovery, he moves the leg gently back into place with as little water resistance as possible. Progress through the water is slow, so a distance of only 25 feet is required.

PROPELLOR

This movement must start with the body in a horizontal floating position on the back, with the feet together, the toes pointed and the arms extended beyond the head, palms uppermost. In this position, the body is propelled feet first by an alternating movement of the hands similar to that used in sculling. Although a certain amount of forearm movement is a help when learning, no more than a slight rotation is allowed in examinations.

To move along, each hand (slightly cupped) is bent back from the wrist until almost at right angles to the forearm, with the palm facing away from the head. It is then flicked outwards (little finger leading) and straightened to a position in line with the forearm which has been rotated slightly. The hands move continuously and fairly quickly, each alternately driving as much water as possible away from the head to give the effect of twin propellors.

Once a reasonable speed has been attained, it is easy to change course by slowing the movement of one hand while sculling more vigorously with the other which alters the direction of drive a little to assist the turn. The turning movement can be further assisted by slightly pointing the toes in the desired direction. In examinations, a complete figure of 8, involving both left and right turns and covering a distance of not less than 60 feet, has to be done.

PORPOISE

The starting position for this movement is face down, horizontal floating, with arms at the sides. A sculling movement of the hands (page 110) is used to propel the body head first along the surface for about 5 feet. The swimmer then ducks his head and shoulders and elevates his legs, as in a surface dive, and, still sculling with his hands, moves along under the surface for the same distance. He surfaces by raising his head and hollowing his back, and repeats the manoeuvre, finishing as he started.

FISH

Fish is an underwater movement in a face-down position, with arms at the sides. A dive, push-off or a surface dive may be used to descend to a depth of about 5 feet, after which the swimmer travels 30 feet at this level, using only a sculling movement of his hands (page 110). He then surfaces by raising his head and hollowing his back.

OYSTER

This is commenced with the body in a horizontal floating position on the back and the arms extended beyond the head. Straight arms and legs then swing quickly upward into a pike position so that the fingers touch the toes of the extended feet. This causes the hips to sink and the body to roll forward, still in the pike position, until fingers and toes are pointing downward and the middle of the back is breaking the surface. This position is held for at least 5 seconds, after which the body is slowly straightened out to a face-down float, with the arms still extended and the heels breaking the surface. It is then rolled over into the starting position on the back and the manoeuvre repeated.

ROLLING LOG

The start and finish of this movement must be the motionless floating position on the back with the arms outstretched beyond the head. The rolling movement is commenced by depressing the shoulder and hip on one side and raising those on the other. Once under way, the muscular movements needed to keep a smooth, even roll come fairly easily, more especially if the swimmer imagines he is a log rolling slowly down a

slope. To avoid finishing with his body at right angles to its starting position, he will probably have to edge himself back into line as each roll is completed. Arms and legs must be kept straight and together and in line with the body, for the required 6 consecutive movements.

PENDULUM

Commence this movement with the body in a motionless floating position on the back, with the arms outstretched beyond the head. The trunk and legs, which must remain straight and in line, represent the pendulum, which swings slowly backward and forward through a half circle.

From beyond the head, the straight arms are slowly moved sideways, just below the surface, until they are in line with the shoulders. At the same time, the head is raised and some air expelled from the lungs. By the time the arms are outstretched sideways, the legs and body should have sunk to a vertical position and the head be in line with them. Arms continue their movement around, and, after a full, quick breath, the face is slowly submerged forward, so that by the time the arms are outstretched in front, the swimmer is facing the bottom of the pool with his legs horizontal and his heels breaking the surface. The swing back of the pendulum is made in the same way. Arms slowly sideways, head up and lungs deflated a little to bring the body vertical; then a full breath, head back and arms slowly together beyond the head. The whole manoeuvre must be done with a smooth, even movement, twice in each direction.

SEAL

The basis of this skill is sculling head first in the prone position. The starting position is floating face down, with the arms at the sides. The head is raised, the back hollowed and the heels lifted just above the surface, and a sculling movement (page 110) used to propel the body about 5 feet along the surface. Then the head is depressed for a dive under water as in Porpoise (page 116). The sculling movement is continued under water for a further 5 feet, after which the swimmer surfaces and, still sculling, rolls completely over and repeats the movement.

SPIRAL SURFACE DIVE

This manoeuvre is commenced as a surface dive, with both hands moving downward simultaneously. When the legs are vertical above the surface, and before the feet are submerged, two complete revolutions of the vertical body are made. A rapid, alternating movement of the hands thrusts the water to one side and turns the body around. This sideways movement must be accompanied by a certain amount of downward thrust to slow the body in its descent, so that the two revolutions can be completed before the feet disappear beneath the surface and end the movement.

SUBMARINE

Submarine is sculling on the back, head first (page 110), with one leg raised vertically from the hips above the surface. After a distance of about 6 feet has been covered at the surface, the swimmer submerges until the water level is midway between the knee and ankle of the raised leg, and travels a further 6 feet at this level. He then surfaces and repeats the manoeuvre.

A very strong sculling movement, with particular emphasis on downward pressure on the hands, is needed to support the raised leg and to propel the body at the surface. An equally strong sculling movement, but with the emphasis on upward pressure on the hands, is needed to submerge and to travel underwater. Throughout the movement, the raised leg must be kept straight and vertical, with the toes pointing upward. The other leg must be straight, with the toes pointed as in sculling.

EXAMINATION CONDITIONS

One of the Society's aims is to encourage as many people as possible to learn how to save lives from drowning. Encouragement is offered by the graded examinations, with their increasingly difficult tests, and by the Society's examiners, who ensure that awards are granted only to those whose work is up to the necessary high standard, and who also urge those who do not reach this standard, to continue their practice.

Most of the examinations are conducted in swimming pools in which rescues are deprived of the realism of the adverse effect of tide, current, wind, and cold, all of which can affect the judgement of a rescuer. All these factors are allowed for by the examiner when deciding on the results of the examinations and commenting upon them to the candidates.

An examiner is a very important officer, without whom the work of the Society could not be accomplished. Candidates who have been successful in the higher awards and have a keen interest in life saving, are invited to tell an oficer of their branch of the Society of their interest in becoming an examiner.

APPOINTMENT OF EXAMINERS

Whether a person is selected by a branch to become an examiner or applies for appointment to this office, the following procedure will be observed.

(1) The candidate will furnish to the branch on a special form, particulars of awards held and experience in the Society's work. Not holding awards will not necessarily disqualify a candidate from becoming an examiner.

(2) To satisfy the Society of his ability, the candidate-examiner will be required to conduct a Bronze Medallion examination in the presence of an examiner appointed by the branch, and that examiner will be responsible for examining the candidate-examiner and the Bronze Medallion candidates.

(3) The candidate-examiner will be required to explain his decisions with regard to the passing or failing of the candidates, to comment generally on their performance, and to pass an oral examination on the contents of the Society's Handbook.

(4) The examiner will certify on the appropriate form that the candidate-examiner has passed or failed the examination and will forward the form without delay to the branch.

(5) If the branch approves of the appointment of the candidate-examiner as an examiner, it will issue a card of authority and forward the form to the Council, R.L.S.S., N.Z., which will endorse the appointment. The Council will then add the name to the New Zealand Panel of Examiners and issue an Examiner's Badge.

AWARDS OF THE SOCIETY

The awards of the Society are:

(1) Resuscitation Certificate
(2) Elementary Certificate
(3) Intermediate Star
(4) Bronze Medallion
(5) Bars to Bronze Medallion
(6) Junior Instructor's Certificate
(7) Senior Instructor's Certificate
(8) Bronze Cross
(9) Bars to Bronze Cross
(10) Award of Merit
(11) Bars to Award of Merit
(12) Distinction Award
(13) Diploma

EXAMINATIONS

All candidates for the Society's examinations (other than for the Resuscitation Certificate and Elementary Certificate), except those from Her Majesty's Regular Forces, and such Institutions, Associations, or persons as the Council, R.L.S.S., N.Z., or branches may from time to time exempt, MUST be either individual members of the Society or members of a club, school, class, institute or kindred association affiliated to the Society.

When an examination is required, the person in charge will apply to the branch stating:

(1) The award for which the examination is required.

(2) The place suggested for the examination.

(3) Alternative dates and times suitable for the class.

(4) The number of candidates to be examined.

The names of all candidates (in BLOCK LETTERS) and other necessary details, will be entered carefully on the appropriate form. The form and examination fees will be handed to the examiner at the time fixed for the commencement of the examination.

On the completion or termination of the examination, the examiner will complete the form and forward it with the necessary fees to the branch without delay.

When the results of the examination have been confirmed by the branch, the awards will be forwarded to the successful candidates.

An instructor is not permitted to examine his own class and wherever possible, an examiner will be independent of the class.

The examiner will be solely responsible for the conduct of the examination, but the instructor will be responsible for the safety of the class.

Prior to the examination commencing, the examiner will satisfy himself that the form is correctly filled in, that the candidates presenting themeselves are eligible for the examination, and that, when necessary, they are correctly clothed.

The rules and conditions as they appear in the latest edition of this Handbook must all be strictly observed but the order of events in the examination, the position of candidates in the class, and such similar matters are at the discretion of the examiner.

The various drills must be conducted by the same words of command as in this Handbook, without any explanation. Each candidate must be examined in every section of the examination.

Hints to Instructors

The instructor is in charge of the class and should use the words of command set out in this Handbook. He should remember that an examiner is favourably impressed by a class which gives a clear demonstration of its knowledge and carries out its movements smartly and in an orderly manner.

Instructors are strongly recommended not to present a class until they are sure that the candidates have been fully trained in each test of the examination for which they are entered, and certain that they can complete the swim WITHIN the time allowed. They should frequently change the position of members of the class during practice as a candidate may be asked to work with any other in an examination.

If it is necessary in the water work to make use of a subject who is not undergoing examination, the odd candidate will swim the full distance outward and return on his back without use of arms, on each occasion when he would have been normally acting as patient. Only if there is an odd number presented for examination may such a subject be used.

The alternative to the surface dive is to be used only if a suitable depth of water is not available.

Number of Examiners

For examinations up to and including the Award of Merit, one or two examiners may be used at the discretion of the branch executive, but for the Distinction Award and Diploma, two examiners must be used. The examiner or examiners will certify the result of the examination by signing the examination form.

For examinations up to and including the Bronze Medallion, the examiner will pass or fail a candidate, not necessarily awarding marks, but for all the higher examinations, the examiner will award marks on the following basis:

A maximum of 10 marks for each test or separately numbered part of a test. For a pass, an average of 6 marks is the minimum, provided that no individual mark is less than 5.

1-4 points—Unsatisfactory and fail.
5 points—Bare Pass.
6 points—Fair.
7 points—Fairly good.
8 points—Good.
9 points—Excellent.
10 points—Perfect.

DRILL FOR EXAMINATIONS—On Land.

A certain amount of life saving land drill, varying according to the award, is essential in instruction. Initial teaching of releases and rescues is easier and more efficient on land and saves valuable time at water practices.

After the class has reformed following resuscitation drill, the orders for RELEASE DRILL WILL be given.

Form Two—Deep.

Front Rank—About Turn.

The instructor will inform the class of the method of release to be demonstrated and the class will do the release in a tidy manner—first one number of each pair acting as the rescuer, and then the other member.

On completion of the drill, the order will be given—

Front Rank—About Turn.
Class—Re-form.

COMMANDS FOR EXAMINATIONS IN THE WATER

The class will form up in single rank, at ease, and in the order instructed, one pace from the edge of the pool. Here they will carry out the necessary drill preparatory to diving in. Example—Attention.

From the right in twos—Number.
Form Two—Deep.
From the right—Extend.
Swimming 330 yards, Ready—Go.

Between each numbered test, one minute's rest in the water is permitted, after which the instructor will give the necessary commands.

Example—Neck Release No. 2, Carry No. 3.
Patient Ready—Go.
Rescuer Ready—Go.

RESUSCITATION CERTIFICATE

The conditions for the Resuscitation Certificate are:—

(a) No age limit.

(b) Examination Fee, 10c.

(c) The candidate shall carry out the following practical tests—

(i) The drill for the Expired Air method of Artificial Respiration (page 53) for a period of two minutes.

(d) The candidate shall answers questions on—

(i) The circulation of the blood.

(ii) Normal Breathing.

(iii) Treatment following drowning, suffocation, or electric shock.

(iv) Use of bystanders and other assistance.

The Examiner can either ask the questions orally or require written answers.

ADVANCED RESUSICATION CERTIFICATE

The conditions for the Advanced Resuscitation Certificate are:—

(a) Minimum age, 16 years.

(b) Examination Fee—50 cents.

(c) The candidate shall carry out the following practical tests—

(i) The drill for the Expired Air Method of Resuscitation (page 53) using an Ambu Manikin, Cheshire-Wilson Trainer, or similar device, to demonstrate the breathing for a continuous period of three minutes.

(ii) The Drill for the Silvester Method of Resuscitation (page 59) for a continuous period of five minutes. The time taken to carry out any set of twelve consecutive cycles must be not under 48 nor over 72 seconds.

(iii) A demonstration of External Cardiac Resuscitation (page 68), preferably using an Ambu Manikin, but applying only token pressure when a patient is used.

(d) The candidate shall answer questions on—

(i) The physiology of respiration and the circulation of the blood, particularly as it concerns resuscitation.

(ii) The practical application of Expired Air Resuscitation, the Silvester Method of Resuscitation, and External Cardiac Resuscitation.

The examiner may either ask questions orally or require written answers.

The Handbook of R.L.S.S., N.Z. provides for only the minimum requirements of this section (d). Candidates are recommended to supplement this by wider reading.

ELEMENTARY CERTIFICATE

The conditions for the Elementary Certificate are:—

(a) No age limit.

(b) Examination Fee, 10c.

(c) The candidate shall carry out the following practical tests—

(i) The drill for the Expired Air method of Resuscitation (page 53) for a period of two minutes.

(ii) Demonstrate on land one method of rescue, as instructed by the Examiner, from the following methods of reach or throw:

(1) Demonstrate a rescue using—a branch, or length of wood, or a ladder, or two articles of clothing (or towels) tied together.

(2) Throw an unweighted rope to within 3 feet of a point which is fifteen feet distant from the thrower (page 78).

(iii) Swim continuously fifty yards—twenty-five yards each by any two of the following strokes:

Crawl (page 22).
Breast stroke (page 19).
Side stroke (page 20).

(iv) Swim by any stroke ten yards to a patient, and with Hair, Clothing or Chin Carry (page 102), tow the patient back to the starting point.

(v) Surface dive to a depth of five feet, recover an object and bring it to land.
As an alternative to (v) when a suitable depth of water is not available—surface dive, swim twenty feet under water, recover an object and bring it to land.

(d) The candidate shall answer simple questions on—

(i) The circulation of the blood.

(ii) Normal breathing.

(iii) Treatment following drowning.

INTERMEDIATE STAR

The conditions for the Intermediate Star are—

(a) No age limit.

(b) Examination Fee, 30c.

(c) Cost of additional badge—
Costume, 2 ins. x 2ins., 5c; 3ins. x 3ins., 25c.

(d) The candidate shall carry out the following practical tests—

(i) The drill for the Expired Air method of Resuscitation (page 53) for a period of two minutes.

(ii) Demonstrate on land Neck Release 2 (page 98) and Body Release 1 (page 100).

(iii) Swim continuously 330 yards in 12 minutes an equal distance of each of any three of the following strokes—
Crawl (page 22).
Breast stroke (page 19).
Side stroke (page 20).
Life Saving Back stroke without use of arms (pages 89 and 90).

OR if length of pool unsuitable for this distance—
Swim continuously 300 yards in eleven minutes.

(iv) Swim by any stroke fifteen yards to a patient, release from patient's grasp by Wrist Release No. 1 (page 94) and tow the patient back to the starting point using The Chin Carry (Carry No. 2, page 103).

(v) Swim by any stroke fifteen yards to a patient, and with Tired Swimmer Carry (Carry No. 4, page 104), push the patient back to the starting point.

(vi) Surface dive to a depth of six feet, recover an object and bring it to land.

As an alternative to (vi) when a suitable depth of water is not available, surface dive, swim twenty-five feet under water, recover an object and bring it to nearest landing point.

(vii) Tread water for sixty seconds with arms folded.
As an alternative to (vii) when a suitable depth of water is not available, float for sixty seconds without moving arms or legs.

(e) The candidate shall answer questions on—
  (i) The circulation of the blood.
  (ii) Normal breathing.
  (iii) Treatment following drowning.
  (iv) Any practical test he may be required to undertake under (d).

BAR TO INTERMEDIATE STAR

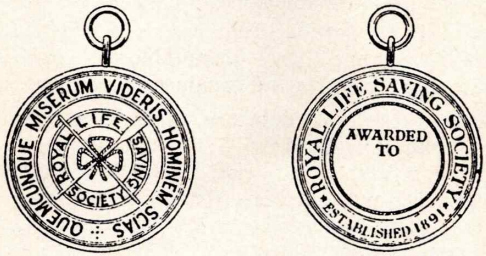
(a) Examination Fee, 30 cents.

(b) Candidates may be re-examined after the expiry of six months from the date of the Intermediate Star Examination, but one re-examination only is permitted.

(c) The test shall be the complete re-examination for the Intermediate Star.

(d) The award, after the successful re-examination, will consist of two bronze bars on a ribbon in the Society's colours, one having the letters R.L.S.S. on, the other I.S.B.

BRONZE MEDALLION



The conditions for the Bronze Medallion are—

(a) Minimum age, 13 years.

(b) Examination Fee, 75c.

(c) Cost of additional badge—Coat (tie-pin or brooch back), 30c; Costume, 30c.

(d) The candidate shall carry out the following practical tests—
  (i) The drill for the Expired Air method of Resuscitation (page 53) for a period of two minutes.
  (ii) Demonstrate on land one method of release (page 94-101) as instructed by the Examiner.

(iii) Swim continuously 330 yards in ten minutes, swimming—

110 yards Crawl (page 22).

110 yards Breast stroke (page 19) or Side stroke (page 20).

110 yards Life Saving Back stroke, without use of arms (page 89-90),

OR, if length of pool unsuitable for this distance—
Swim continually 300 yards in nine minutes, swimming 100 yards of each stroke instead of 110 yards.

(iv) Swim by any stroke twenty yards to a patient, release from patient's grasp round neck by Neck Release No. 2 (page 98) and tow the patient back to the starting point, using the Hip Carry (Carry No. 3, page 103).

(v) Swim by any stroke twenty yards to a patient, release from the patient's grasp by Body Release No. 1 (page 100), support him with hands under patient's armpits from behind for thirty seconds within a six-feet circle and then tow him to starting point by using the Two Handed Head Carry (Carry No. 1, page 102).

(vi) Swim by any stroke twenty yards to a patient and with Tired Swimmer Carry (Carry No. 4, page 104), push the patient back to the starting point.

(vii) Surface dive to a depth of six feet, recover an object and bring it to land.
As an alternative to (vii) when a suitable depth of water is not available—surface dive, swim thirty-five feet under water, recover an object and bring it to nearest landing point.

(e) The candidate shall answer questions on—

(i) The circulation of the blood.

(ii) Normal breathing.

(iii) Treatment following drowning, suffocation, or electric shock.

(iv) Use of bystanders and other assistance.

(v) Any practical test he may be required to undertake under (d).

The Examiner can either ask the questions orally or require written answers.

BARS TO BRONZE MEDALLION

(a) Examination Fee, 75c.

(b) Candidates may be re-examined after the expiry of six months from the date of the previous test, but one re-examination only will be permitted in each year ending 31st May.

(c) The test shall be the complete re - examination for the Bronze Medallion.

(d) The award, after the first successful re-examination, will consist of two bronze bars on a ribbon in the Society's colours, one bar having the letters R.L.S.S. on the face, the other, B.M.B.

For the second and successive re-examination, the latter bar only will be awarded.

COMBINED R.L.S.S., N.Z. AND N.Z.S.L.S.A. BRONZE MEDALLION EXAMINATION

The examination fees for both the R.L.S.S., N.Z. Bronze Medallion and the N.Z.S.L.S.A. Surf Medallion are payable and on being successful in the examination candidates will receive both medallions.

The Candidate is to be examined by two examiners, one of whom shall also be an examiner of The R.L.S.S., N.Z. A holder of the R.L.S.S., N.Z. Bronze Medallion attempting the Surf Bronze will comply with all the requirements of that examination except that tests 6 to 10 inclusive shall be exempt.

The examination is as follows:

SECTION A—Compulsory:

1. Swim 440 yards in under 9 minutes.
2. Demonstrate Expired Air Resuscitation using Ambu Mask or approved manikin.
3. Demonstrate single man combined Expired Air Resuscitation and External Cardiac Resuscitation.
4. Demonstrate R. & R. Signals and B. & S. Signals.
5. Tie a Clove Hitch, Reef Knot and Fishermans Knot.
6. Demonstrate on land one method of release from the R.L.S.S., N.Z. Handbook as instructed by the examiner.

7. Surface dive or, when a suitable depth of water is not available surface dive, swim 35 feet under water, recover an object and bring to nearest landing point.
8. Swim by any stroke 20 yards to a patient, release from patient's grasp round the neck by 'Neck Release No. 2' and tow the patient back to the starting point, using the 'Hip Carry'.
9. Swim by any stroke 20 yards to a patient, release from the patient's grasp by 'Body Release No. 1', support him with hands under patient's armpits from behind for one minute, within a six foot circle, and then tow him to the starting point by 'two handed carry'.
10. Swim by any stroke 20 yards to a patient and with the 'Tired Swimmer Carry' push the patient to the starting point.
11. Assemble Belt.
12. Take Carotid Pulse.

SECTION B—Compulsory:

Five Oral questions on each topic:
Surf Practice, Physiology, First Aid.

SECTION C

Candidates must be examined in at least one of the following options:

1. 6 Man R. & R.
2. 4 Man R. & R.
3. Single Man Rescue and Board or Ski Rescue:
   (a) 100 yards Rescue Tube Tow
   (b) Board or Ski Rescue

JUNIOR INSTRUCTOR'S CERTIFICATE

(a) Minimum age, 12 years.
(b) Examination Fee, 50c.
gained the Intermediate Star or Bronze Medallion.

(d) The test shall comprise the following—
   (i) The training and presentation simultaneously and as one unit for examination for the Intermediate Star of a class of at least four members, three of whom must be successful. If the class presented numbers more than four, then a minimum of two-thirds of the class must qualify for the Intermediate Star. Candidates must vouch that the training of this class is their work.

(ii) The control of and commands for the class as required by the general conditions governing examinations.

(iii) A demonstration lesson with the class on any part or parts of the drills for release, rescue and resuscitation, with the necessary class corrections, and explanations.

(iv) A short lecture to the class on any point of blood circulation, respiration or resuscitation, as required by the Examiner.

(v) A demonstration in the water of any of the practical tests required to pass the Intermediate Star.

(vi) Oral questions on the knowledge required to pass the Intermediate Star.

SENIOR INSTRUCTOR'S CERTIFICATE

(a) Minimum age, 15 years.

(b) Examination Fee, 75c.

(c) Cost of the Badge—Coat, 40c; Costume, 30c.

(d) The candidate must have gained the Bronze Medallion.

(e) The test shall comprise the following—

(i) The training and presentation simultaneously and as one unit for examination for the Bronze Medallion of a class of at least four members, three of whom must be successful. If the class presented numbers more than four, then a minimum of two-thirds of the class must qualify for the Bronze Medallion. Candidates must vouch that the training of this class is their work.

(ii) The control and commands for the class as required by the general conditions governing examinations.

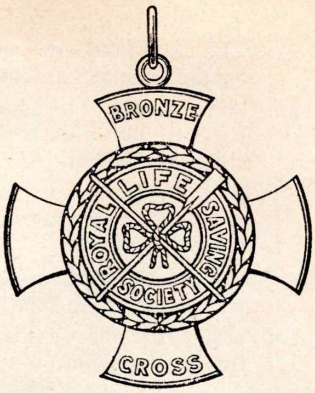
(iii) A demonstration lesson with the class on any part or parts of the drills for release, rescue and resuscitation, with the necessary class corrections and explanations.

(iv) A short lecture to the class on any point of blood circulation, respiration or resuscitation, as required by the Examiner.

(v) A demonstration in the water of any of the practical tests required to pass the Bronze Medallion.

(vi) Oral questions on the knowledge required to pass the Bronze Medallion.

BRONZE CROSS



The conditions for the Bronze Cross are:—

(a) Minimum age, 14 years.

(b) Examination Fee, 80c.

(c) Cost of additional badge — Coat, 40c; Costume, 30c.

(d) The candidate must have gained the Bronze Medallion.

(e) The candidates shall carry out the following practical tests: present themselves for examination dressed as follows:

Men—Swimming costume or trunks, singlet, full length trousers secured by belt or braces.

Women—Swimming costume, vest, skirt, properly secured.

(i) Swim continuously 660 yards in twenty-four minutes, swimming—

220 yards Crawl (page 22).

220 yards Breast stroke (page 19) or Side stroke (page 20).

220 yards Life Saving Back stroke without the use of arms (page 90),

OR, if length of pool unsuitable for this distance —Swim continuously 600 yards in twenty-two minutes, swimming 200 yards of each stroke instead of 220 yards.

(ii) Swim by any stroke twenty-five yards to a patient similarly dressed, release from patient's grasp round body from behind using Neck Release No. 3 (page 99), and tow the patient back to the starting point by the Hip Carry (Carry No. 3, page 103).

(iii) Swim by any stroke twenty-five yards to a patient similarly dressed, support him for sixty seconds with hands under patient's armpits, tow the patient back to the starting point by Clothing Carry (Carry No. 2, page 102) and apply, while in the water, either standing or holding on to pool side, Expired Air Resuscitation for thirty seconds.

(iv) Undress in thirty seconds in the water without touching side or bottom of pool.

(v) Surface dive to a depth of six feet, recover an object and bring it to land.
As an alternative to (v) when a suitable depth of water is not available, surface dive, swim thirty-five feet under water, recover an object and bring it to nearest landing point.

(vi) Any three of the following advanced swimming skills—
(1) Twin tail (page 110).
(2) Sculling (page 110).
(3) Somersaults (page 112).
(4) Spinning top (page 113).
(5) Water wheel (page 113).

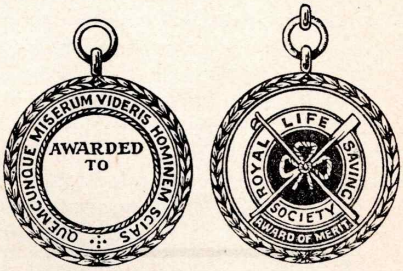
BARS TO BRONZE CROSS

(a) Examination Fee, 80c.
(b) Candidates may be re-examined after the expiry of six months from the date of the previous test, but one re-examination only will be permitted in each year ending 31st May.
(c) The test shall be a complete re-examination for the Bronze Cross.
(d) The award, after the first successful re-examination, will consist of two bars on a ribbon in the Society's colours, one bronze bar having the letters R.L.S.S. on the face, the other bronze and enamel bar bearing the initials B.C.B. on the face. For the second and successive re-examinations, the latter bar only will be awarded.

AWARD OF MERIT

The conditions for the Award of Merit are—

(a) Minimum age, 15 years.
(b) Examination Fee, $1.25.
(c) Cost of additional badge—Coat, 45c; Costume, 35c.
(d) The candidate must have gained the Bronze Cross.



(e) The candidates shall carry out the following practical tests and shall present themselves for examination dressed as follows: Men—Swiming costume or trunks; long sleeved shirt fastened at wrist with collar and necktie; full length trousers secured by belt or braces; waistcoat or similar garment. Women—Swimming costume, panties, skirt which must be properly secured, long sleeved blouse fastened at wrists, or similar garment.

The attire shall be of an ordinary everyday character and must be properly fastened.

(i) Swim continuously 660 yards in twenty-five minutes, swimming—

220 yards Crawl (page 22).

220 yards Breast stroke (page 19) or Side stroke (page 20).

220 yards Life Saving Back stroke, without the use of arms (pages 89-90),

OR, if length of pool unsuitable for the distance—Swim continuously 600 yards in twenty-three minutes swimming 200 yards of each stroke instead of 220 yards.

(ii) Swim by any stroke fifty yards to a patient, release from grasp around neck (Neck Release No. 1, page 97), carry him twenty-five yards by the Hip Carry (Carry No. 3, page 103), and then twenty-five yards by the Chin Carry (Carry No. 2, page 103), finishing in shallow water where Expired Air Resuscitation will be applied for one minute.

(iii) Surface dive to a depth of six feet, conduct an under water search round the perimeter of a circle with a diameter of five yards, recover from its centre, an object, surface and tread water using legs only for thirty seconds.

(iv) Undress in forty-five seconds in the water.

(v) Any three of the following advanced swimming skills—

(1) Plunge (page 114).
(2) Porpoise (page 116).
(3) Fish (page 116).
(4) Oyster (page 116).
(5) Rolling log (page 116).
(6) Marching (page 115).

(vi) Dive—8 to 10 feet (page 107).

(vii) Jump—8 to 10 feet (page 108).

BARS TO AWARD OF MERIT

(a) Examination Fee, $1.25.

(b) Candidates may be re-examined after the expiry of six months from the date of the previous test, but one re-examination only will be permitted in each year ending 31st May.

(c) The test shall be a complete re-examination for the Award of Merit.

(d) The award, after the first successful re-examination, will consist of two bars on a ribbon in the Society's colours, one silver and enamel bar having the letters R.L.S.S. on the face, the other a silver and enamel bar bearing the initials A.M.B. on the face. For the second and successive re-examinations, the latter bar only will be awarded.

DISTINCTION AWARD

The conditions for the Distinction Award are:—

(a) Minimum age, 16 years.

(b) This award comprises both distinctive embossed certificate and a badge incorporating St. Edward's Crown.

(c) Examination Fee, $2.50.

(d) Cost of additional badge—Costume, 40c.

(e) The candidate must have gained the Award of Merit.

(f) The candidates shall carry out the following practical tests and shall present themselves for examination dressed as follows: Men—Swimming costume or trunks; long-sleeved shirt fastened at wrists with collar and necktie; full length trousers secured by belt or braces; socks, waistcoat or similar garment; laced shoes.

Women—Swimming costume, panties, stockings properly suspended or pantyhose; skirt which must be properly secured; long-sleeved blouse fastened at wrists or similar garment; laced shoes.

The attire shall be of an ordinary everyday character and must be properly fastened.

(i) Swim continuously 330 yards in fifteen minutes, swimming—

110 yards Crawl (page 22) or Butterfly (page 25).
110 yards Breast stroke (page 19) or Side stroke (page 20).
110 yards Back crawl (page 23) or English Back stroke (page 24),

OR, if length of pool unsuitable for this distance—
Swim continuously 300 yards in fourteen minutes swimming 100 yards of each stroke instead of 110 yards.

(ii) Swim by any stroke twenty-five yards to a patient dressed as for the Bronze Cross examination, release from patient's grasp round body using Body Release No. 1 (page 100) and tow the patient twenty-five yards to starting point by the two handed head carry (Carry No. 1, page 102).

(iii) Swim by any stroke twenty-five yards to a patient dressed as for the Bronze Cross examination, release from patient's grasp round body from behind by body release No. 2 (page 101) and tow the patient twenty-five yards to the starting point by the Hip Carry (Carry No. 3, page 103).

(iv) Undress in one minute in the water.

(v) Surface dive to a depth of six feet, conduct an under water search round the perimeter of a circle with a diameter of five yards, from its centre retrieve an object, bring to the surface, exchange object for patient, apply Expired Air Resuscitation five breaths (page 63), tow patient fifteen yards, apply Expired Air Resuscitation again three breaths, tow patient to nearest suitable point to land, apply Expired Air Resuscitation again three breaths, land patient and apply Expired Air Resuscitation for one minute.

(vi) Any three of the following advanced swimming skills:

(1) Plunge (page 114).
(2) Motionless floating (page 111).
(3) Rolling log (page 116).
(4) Propellor (page 115).
(5) Pendulum (page 117).
(6) Seal (page 117).

(vii) Dive, 8 to 10 feet (page 107).
(viii) Jump, 8 to 10 feet (page 108).
(ix) Demonstrate External Cardiac Resuscitation and answer questions thereon. Apply only token pressure on a live patient, full pressure if a Manikin is used.

N.B. The granting of this award is subject to confirmation by the Council of The Royal Life Saving Society, New Zealand.

THE DIPLOMA OF THE SOCIETY

The conditions for the Diploma are—

(a) Minimum age, 17 years.
(b) Examination Fee, $6.00 (includes both a Coat and Costume badge).
(c) The candidate must have gained the Distinction Award.
(d) The examination shall consist of two sections—
(i) Practical.
(ii) Theoretical.

The Practical test of the examination must be taken at least twenty-one days before the Theoretical section, and the candidate must be passed by two Examiners in this section to permit him to sit the Theoretical paper.

A candidate who is successful in the Practical tests but not in the Theoretical section, may retake this part at the next examination provided the fee of $3.00 is paid.

Candidates obtaining 75 per cent. or over of the maximum marks for each test and numbered part of a test in both the Practical and Theoretical Parts, shall be placed in the Honours Division and receive a medal in addition to the Diploma.

(e) The Practical section of the examination shall consist of the following tests and candidates shall present themselves for examination dressed as for the Distinction Award.

(i) Swim fifty yards by any stroke and allow a patient dressed as for the Bronze Cross examination to take hold round the neck from behind, release from the hold by Neck Release No. 3 (page 99), tow the patient fifty yards by Hip Carry (Carry No. 3 page 103), land patient at nearest suitable point and apply Expired Air Resuscitation for one minute.

(ii) Swim under water for twenty yards.

(iii) Undress in sixty seconds in the water.

(iv) Swim continuously 440 yards in nine minutes demonstrating any four of the following swimming strokes—

Front Crawl (page 22).
Back Crawl (page 23).
Breast stroke (page 19).
Side stroke (page 20).
English Back stroke (page 24).
Butterfly (page 25).

swimming 110 yards of each stroke;

OR, if length of pool unsuitable for the distance,

Swim continuously 400 yards in eight minutes swimming 100 yards of each stroke instead of 110 yards.

(v) Any six of the following advanced swimming skills:

(1) Seal (page 117).
(2) Pendulum (page 117).
(3) Marching (page 115).
(4) Propellor (page 115).
(5) Rolling log (page 116).
(6) Motionless floating (page 111).
(7) Oyster (page 116).
(8) Somersaults (page 112).
(9) Spiral surface dive (page 118).
(10) Submarine (page 118).

(vi) Dive, 8 to 10 feet (page 107).

(vii) Jump, 8 to 10 feet (page 108).

(viii) Demonstrate External Cardiac Resuscitation (page 68) and answer questions thereon. Apply only token pressure on a live patient, full pressure if a Mannakin is used.

(f) The Theoretical section of the examination shall consist of a three hour paper set and marked by The Royal Life Saving Society, New Zealand.

The examination will be held commencing at 9.30 a.m. on the last Saturday of March (avoiding Easter Saturday) and the first Saturday of August in each year, no other time being permitted, and shall be under the control of the Branch Executive, who will decide the place of examination and appoint an invigilator. The examination paper will be based on the following syllabus:

(i) The importance of physical exercise on the growth and development of the body, with special reference to the effect of swimming.
The importance and advantages of swimming to the individual and to the community.

(ii) The fundamental physiology concerning the structure and functions of the lungs, the circulation of the blood and muscle nutrition.

(iii) The effects of, and recuperation from, moderate and excessive exercise. The treatment of cramp.

(iv) The causes of, and the steps to be taken to remedy, asphyxia (particularly electric shock, strangulation, carbon monoxide poisoning and drowning); shock, its action and treatment.

(v) Modern trends of thought in relation to Life Saving and Artificial Respiration.

(vi) A detailed description of one of the following swimming styles—
Breast stroke
Butterfly
Side stroke
Front Crawl
Back crawl
English Back stroke
Life Saving Back stroke
And describe a method of teaching a non-swimmer to swim.

The following books are recommended for reading:

Swimming, Bill Juba—Stanley Paul, London.

Principles of Anatomy and Physiology, Royal Air Force—Her Majesty's Stationery Office.

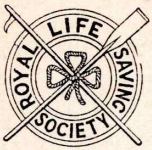
Man and His Body, Miller and Goode—Victor Gollancz Ltd., London.

Handbooks of Instruction—United Kingdom, Canada, Australia, New Zealand.

EXAMINATION FEES

	$
RESUSCITATION CERTIFICATE	.10
ADVANCED RESUSCITATION CERTIFICATE	.50
ELEMENTARY CERTIFICATE	.10
INTERMEDIATE STAR	.30
BAR TO INTERMEDIATE STAR	.30
BRONZE MEDALLION	.75
BAR TO BRONZE MEDALLION	.75
BRONZE CROSS	.80
BAR TO BRONZE CROSS	.80
JUNIOR INSTRUCTOR'S CERTIFICATE	.50
SENIOR INSTRUCTOR'S CERTIFICATE	.75
AWARD OF MERIT	1.25
BAR TO AWARD OF MERIT	1.25
DISTINCTION AWARD	2.50
DIPLOMA OF THE SOCIETY	6.00
"HANDBOOK OF INSTRUCTION"	.50

THE OFFICIAL BADGES



The registered Badge of the Society can be worn only by holders of the Intermediate Star and higher awards of the Society. It is a white and blue enamel pin-backed badge for the coat and is woven in silk on cloth for attachment to swimming costumes. It is hoped that this badge will be worn on all suitable occasions. Special Badges also can be obtained by holders of the particular higher award indicated.

NOTE.—In every case when ordering badges, the following particulars must be given, and remittance should accompany order:—

(1) Name of class. (2) Awards held.

(3) Year in which these were obtained.

COAT BADGES	**Each**
	$
Intermediate	.30
Bronze Medallion	.30
Bronze Cross	.40
Instructor	.40
Award of Merit	.45
Distinction Award	.55
Diploma	.75

COSTUME BADGES	
Intermediate (2ins. x 2ins.)	.05
Intermediate (3ins. x 3ins.)	.25
Bronze Medallion	.30
Bronze Cross	.30
Instructor	.30
Award of Merit	.35
Distinction Award	.40
Diploma	1.25

BLAZER BADGES: Prices on application.

THE ROYAL LIFE SAVING SOCIETY

MOUNTBATTEN MEDAL

The Mountbatten Medal of The Royal Life Saving Society for the award holder who makes the best rescue of the year which has not been otherwise signally honoured, is presented by the Grand President of The Royal Life Saving Society, Admiral of the Fleet, Earl Mountbatten of Burma.

All rescues by award holders throughout the world can be considered for this distinction if their bravery has not already been recognised.

Application forms are available from the Hon. Secretary, The Royal Life Saving Society, New Zealand, to whom they should be returned after completion. The forms should be completed within two months of the rescue being effected.

THE ROYAL LIFE SAVING SOCIETY, NEW ZEALAND

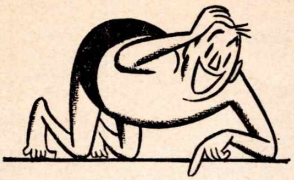
KINGSLAND MEMORIAL MEDAL

The Medal was instituted to perpetuate the memory of Arthur J. Kingsland, who died in London on 9th May, 1957, after many years' outstanding service to the Society in New Zealand. It will be awarded by the Council, R.L.S.S., N.Z., to the award holder of the Society who, in its opinion, makes the most meritorious rescue from drowning within New Zealand and its territories in the year ending 31st December.

Within two months of the rescue being effected, the application form should be returned to the Hon. Secretary, The Royal Life Saving Society, New Zealand, from whom it may be obtained

It is proper that bravery by award holders should be recognised, and the Council of The Royal Life Saving Society, New Zealand, is keen to learn of all rescues, and urges all who know of any to promptly make a report. Much valuable information is thus accumulated.

All applications, if eligible, are first submitted for consideration for the Mountbatten Medal.



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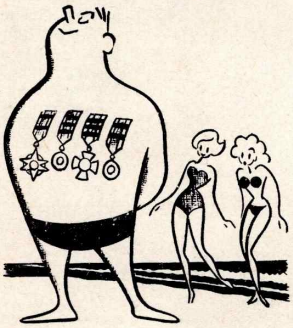

'Whomsoever you see in distress
recognise in him a fellow man.'

THE RAVEN PRESS
CHRISTCHURCH